The Newspaper of Information Systems Management
June 3, 1996, Vol. 30, No. 23, 152 Pages, $6/Copy, $48/Year

COMPUTERWORLD

WHAT'S INSIDE

- 3Com launches aggressive upgrade program and preps new Chipcom switch models. **See story, page 6,** *by Bob Wallace.*
- At DECUS, Digital will unveil the second wave in a series of products aimed at linking its user base to Windows NT. **See story, page 10,** *by Michael Goldberg.*

- Microsoft CEO Bill Gates explores the Internet and other topics with *Computerworld.* **See story, page 12.**
- Support for Java continues to grow. **See stories, page 14.**

Lotus on upgrade snail trail

By Tim Ouellette

Some users say Lotus Development Corp. is taking the slow road to providing a Notes groupware upgrade path for CC:Mail users, and others are growing impatient for updates to Notes 4.0.

Timing is particularly crucial for Lotus because corporate America is in the midst of deciding whether to use World Wide Web-based intranet technology, Notes-type groupware or both.

Migration tools to move the massive base of Lotus CC:Mail users to Notes were promised for last month but are still in beta testing. Also still in beta is a Notes-native CC:Mail message transfer agent, which lets

Lotus, *page 125*

IBM opens Windows

Will treat Microsoft operating systems as OS/2 equal

By April Jacobs and Laura DiDio

After years of dancing around the issue, IBM this week will bow to market trends and broadly support the Windows product line across its range of software offerings.

COMDEX Spring '96

A source at IBM said the company will announce plans at Comdex/Spring '96 in Chicago to roll out versions of its software line on the appropriate Windows platform. "This [move] will be for all of IBM's software offerings," the source said.

In the past, IBM would initially offer software running on OS/2 and follow up with a Unix version. In some cases, IBM would make Windows options available. Now, users will hear IBM say that it will wholeheartedly embrace Windows and Windows NT.

The source also said IBM will make several related product

IBM, *page 16*

IBM baits the Windows hook

January 1995
IBM pulls back on plans to market Windows NT versions of key software products such as its CICS transaction monitor and DB2 database.

August 1995
IBM Chairman Louis V. Gerstner concedes general desktop market to Windows and recasts OS/2 for "serious business uses."

September 1995
IBM's software units are told internally to move quickly to develop Windows NT versions of their products.

November 1995
IBM officials confirm that Windows NT is on the same priority level for future software releases as OS/2 and AIX.

March 1996
IBM announces a set of integrated software servers, code-named Project Eagle, that will support Windows NT, OS/2 and AIX.

MCI 'net delays still vexing users

By Mitch Wagner and Kim Girard

Several businesses looking for high-speed Internet connectivity complain they are still grappling with delays caused by MCI Communications Corp. — despite MCI tripling its Internet backbone capacity in mid-April.

Some MCI customers looking for T1 Internet lines say their connections are months late, and they are suffering various repercussions as a result. They said MCI repeatedly gave dates when the installations were supposed to be done and then missed those deadlines.

MCI spokesman Allen Clark last week wouldn't comment

MCI, *page 125*

Help desk to workers: Don't call us, use 'net

Hilton Hotels' Laurel Bailey: *Sales staffers shun self-help manuals*

By Julia King and April Jacobs

Corporate help desks are busy installing cost-saving, intranet-based self-help software, but stubborn users continue to take the most expensive route — picking up the phone and calling for assistance.

Since last fall, several vendors have released software that lets end users file and check trouble tickets and access self-help databases over a corporate intranet.

"If users are able to submit a problem over the intranet in a minute rather than wait on hold for 15 minutes, there's a productivity gain,"

Self-help, *page 28*

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Computerworld Smithsonian Awards

Put technology in people's hands, and watch the benefits to society multiply. This week, we honor some of the innovators. **See In Depth, page 93**

Levi's' personal location device, High Techsplanations' surgical simulator, program and New York Schools' CD-ROM on American Sign Language

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Inside Computerworld

June 3, 1996

News

NEWS

Banking on savings
When Chase Manhattan and Chemical banks merge next year, they could save $40 million in annual IT-related costs.

DEC connects to NT
Digital builds more products to link its midrange boxes to NT.

Prestone goes EDI
The antifreeze king has started a $5 million EDI program to tighten its marketing and distribution links with retailers that sell its products.

Cyberfight
Industry to Clinton: "Drop encryption policy."

PCS auctions
Recent FCC auctions of PCS licenses have already led to defaults by winning bidders.

OPINION

Justifying Intranets
When it comes to intranets, companies are escaping the bean counters — at least for now — Maryfran Johnson explains.

Telecom reform
Humorist Bruce Hoard says merger mania among the Baby Bells has all the logic of returning communism to Russia.

IS architecture
Never heard of "classification theory?" Melissa Cook says it's crucial for clarifying your corporate information architecture.

This week in

Home of the weird
You need them, but you want to kill them. How do you manage the weirdos that pop up in the high-tech world? Join *Computerworld*'s Allen Alter in an online conference for tips on managing eccentric geniuses.

Notes on the spot
Is Notes doomed by the Web? Voice your opinion in our QuickPoll.

Motley Fools talk amold
Find out why you know more than Wall Street experts when it comes to high-tech stock investing. See our in-depth interview with one of the Motley Fools, champions of the small investor.

www.computerworld.com

Choice Cuts

Finding time for training.
Well, there's never enough time. But some IS staffers, such as Jim Robinson (right), and managers squeeze in study time around the clock.
See Managing, page 80

Multimedia's mess.
Multimedia is still a monstrous, maddening — yet seductive — mess. **Computerworld** *surveyed 20 users, who share their experiences with their peers.*
See Buyer's Guide, page 80

Technical Sections

SERVERS & PCs

Losing laptops
Laptop theft is a bigger problem in the office than on the road.

NT on the desktop
Corporate PC buyers will have a choice of NT-ready desktop PCs by the end of the year.

SOFTWARE

R/3 issues
Westinghouse Electric's top SAP challenges: recruit R/3 experts and fight user resistance.

Powersoft review
The latest version of PowerBuilder is ready for enterprise applications, our reviewer says.

THE ENTERPRISE NETWORK

Users as vendors
With regulatory restrictions removed, several large utilities are competing for your local and long-distance traffic.

Managing Cabletron data
Data warehousing extensions coming from Cabletron should make it easier to deal with volumes of network info.

THE INTERNET

Search engines
A hot new robot crawls the Web.

Lotus and the Web
Lotus unveils more specifics about its plans to let users access Notes with Web browsers.

CORPORATE STRATEGIES

Client/server on the radio
CBS Radio's client/server system may expand its franchise.

Do what I say . . .
Their market is built on promoting collaboration, but management consultancies aren't all on the groupware bandwagon.

On being a Fool
A Q&A with David Gardner, one of the founders of the Motley Fool online investment forum. **See Finance & Investing, page 121**

Features

MANAGING

They yearn to learn
How IS staffers and managers squeeze in study time during the day — and night.

Letting go
You can't control everything that goes on your intranet, but then again, you may not have to.

IN DEPTH

1996 *Computerworld* Smithsonian Awards nominees

CAREERS

Summer sizzlers
A look at the hottest tools, technologies and jobs this summer.

MARKETPLACE

PC Expo-bound
Networking is on the minds of IS managers heading for this month's PC Expo.

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IS YOUR BACKUP TOUGH ENOUGH FOR THE JOB?

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Someday, television newscasts may include pollution maps and forecasts such as "a chance of acid rain, with patches of ozone." William L. Hibbard, a staff scientist at the University of Wisconsin-Madison, has developed "chemical meteorology" software that produces three-dimensional graphics much like satellite weather maps — except they depict otherwise invisible clouds of pollution. The red fog above is sulfur dioxide, an element of acid rain.

These recently issued U.S. patents were gleaned from MicroPatent's Patent Server at www.micropat.com. (Patent number, inventor/assignee, date issued)

- A charitable donation kettle — such as the ones used by the Salvation Army — with a computer workstation that accepts credit-card transactions and tallies the donations. (5,506,393, Witold A. Ziarno, April 9)
- An automated cake-decorating system. A flatbed image scanner feeds the photograph or design into an 1486-based PC, which controls a robotic arm and colorant dispensers. (5,505,775, John Kitos, April 9)

- A system for remote analysis of a person's emotional or metabolic state, such as performing a secret lie-detector test from a distance. Energy waves are reflected off the subject to determine blood pressure, pulse rate, pupil size, respiration rate and perspiration level. A computer compares the readings with normal levels. (5,507,291, Robert C. Stirble and Peter J. Wilk, April 16)

Alleged bank robber Leslie Isben Rogge, one of the 10 most-wanted fugitives in the U.S., was arrested in Guatemala after an Internet user recognized his picture from the FBI's Web page, Reuters reports.

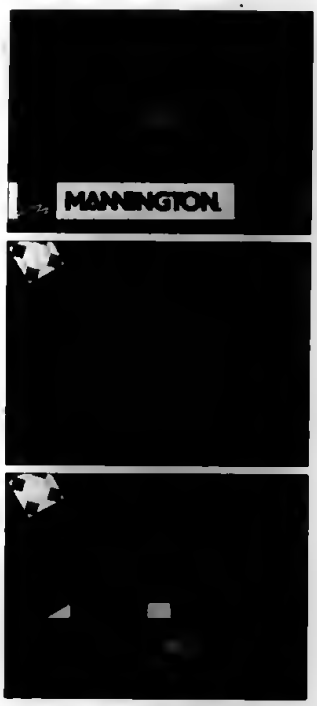
Never let it be said that Sun's Java programming language isn't useful. A Java applet of the old Pac-Man video game can be played at www.csd.uu.se/~alexb/.

The folks in academia continue to dream up new ways to look at the field of data processing. Edith Cowan University in western Australia is developing a scholarly journal called the *Journal of Holistic Research in Information Systems*. The electronic journal, which premieres in December, will analyze "holistic approaches" to systems planning and engineering, including human factors such as human/computer interaction and "the influence of politics and culture on systems development."

■ **Send contributions of offbeat news, lists and anecdotes to mbetts@cw.com.**

Aesop's fabled robot

Aesop, a surgical robot from Computer Motion in Goleta, Calif., will soon respond to voice commands. The robot gives surgeons a rock-steady "third hand" by positioning a laparoscope so the surgeon can see what he's doing in minimally invasive procedures. The next-generation version — called Aesop 2000 — will respond to simple voice commands rather than foot-pedal controls. Aesop has already assisted in more than 12,500 surgeries.



Customers who need expert advice about vinyl floor covering can get recommendations from retail kiosks that feature the Mannington Mills flooring election system. The interactive kiosks, developed by Frontier Media Group in Malvern, Pa., help customers pick the color, pattern and wear performance that is right for their room.

altcw

News shorts

Taxing technology

Several Florida counties are trying to levy property taxes on custom software programs developed by high-tech firms.

The firms, including **Airbus Service Co., Lockheed Martin Missile and Space, General Electric Co.** and **Encore Computer Corp.**, are fighting back in county courts, where they have filed suit to block the tax bills.

The Florida legislature recently failed to resolve the issue of taxing software, which could result in a charge of between 2 cents and 25 cents per $1,000 of assessed value. There is no consistent method of taxing software among states, so many states opt to exempt software rather than try to assess something that can rapidly become obsolete. Florida recently halted an effort to tax Internet service providers, pending further investigation of the issue.

Oracle loses NC chief

Andrew Laursen, who headed the development of **Oracle Corp.**'s Network Computer (NC), left Oracle May 20 to head research and development at start-up **Unwired Planet, Inc.**, in Redwood City, Calif. The start-up's CEO, Alain Rossmann, wouldn't say what the firm intends to produce.

Oracle spokesman Dan Berkowitz said Laursen left on good terms but confirmed that his position had been taken over by Oracle Senior Vice President Jerry Baker.

Apple reshuffle complete

Apple Computer, Inc. Chairman and CEO Gilbert F. Amelio completed his management reorganization late last week with a sweeping reshuffling of responsibilities.

He appointed John Floisand to head the company's worldwide sales team. Floisand replaces Apple Americas President Jim Buckley, who resigned from the company on Thursday. Chief Operating Officer Marco Landi will implement Apple's new plan as well as temporarily head up two divisions devoted to special-purpose products and service/support.

Senior Vice President Isaac Nassi will head AppSoft, the operating systems and tools division; Chief Scientist Larry Tesler will supervise AppleNet, the Internet and intranet division.

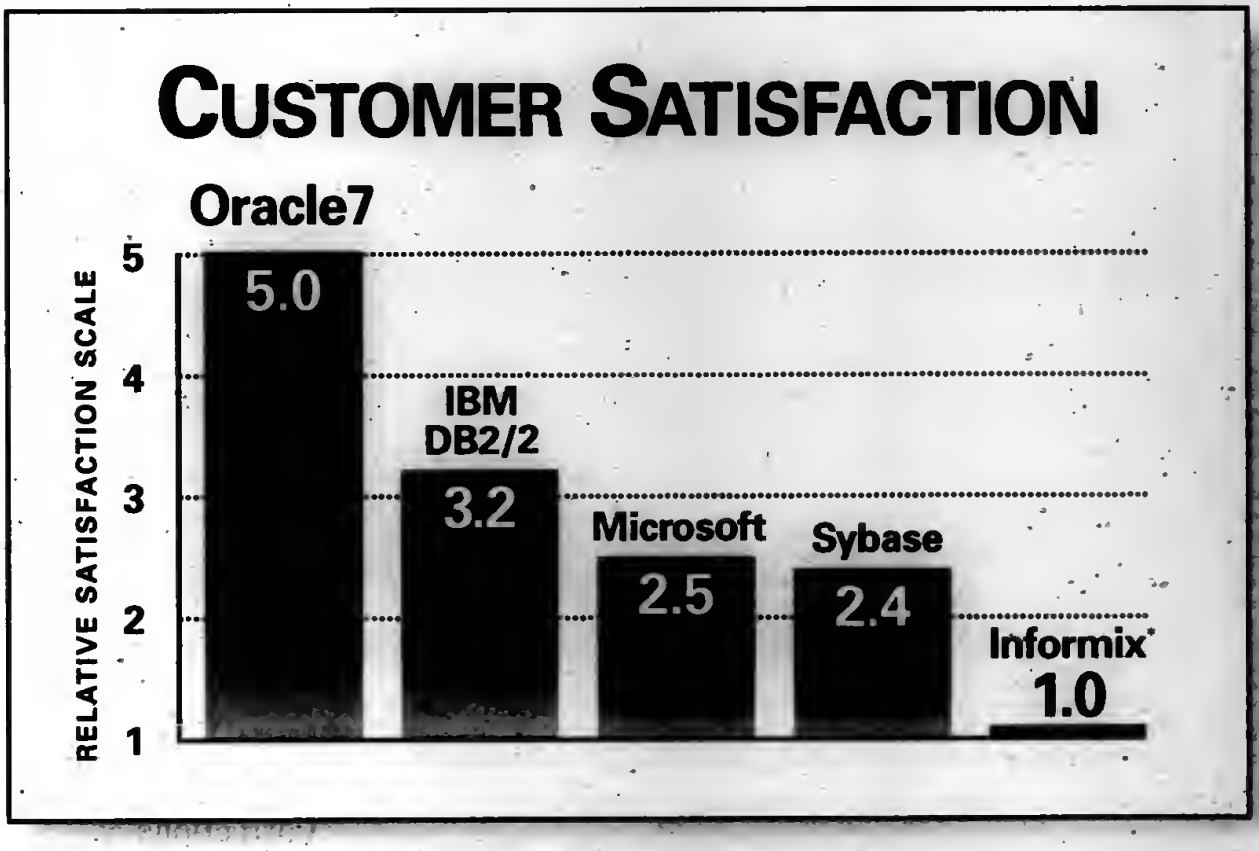
Samsung trims chips

Samsung Electronics Co. in South Korea, the world's largest manufacturer of computer memory chips, is cutting production of chips for the rest of the year. The company last week said it will close its factories two days each month to deal with a sharp oversupply that has sent memory prices plunging in the past few months.

For more **News shorts**, *see page 8*

Can't Get No Satisfaction? Try Oracle7.

Computerworld asked database users to grade their satisfaction level. In comparison to Microsoft and Sybase users, twice as many Oracle users rated their satisfaction an "A," the highest grade allowed. And, as you would expect, five times as many Oracle users rated their satisfaction an "A" when compared to Informix's ranking.



The prestigious *Computerworld* Buyer's Satisfaction Scorecard concluded, "Oracle7.1 Enterprise Server is far ahead of the competition in...customer satisfaction..." A surveyed Oracle customer said, "In my 20 years of database experience [Oracle7] is by far the cleanest. It practically has no bugs."

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Computerworld survey results as of April 15, 1996. *Informix results based on smaller sampling due to lack of response

3Com encores Oncore

Former Chipcom hub offered to rival users as a trade-up

By Bob Wallace

Just when Chipcom Corp. users thought 3Com Corp. had forgotten them, out comes the networking powerhouse with new models of Chipcom's flagship Oncore hub and an aggressive trade-up program open even to users of rival hubs.

3Com acquired Chipcom through a $775 million merger last October and with it a vast and loyal user base. Users feared the worst when the merger resulted in two overlapping lines of high-end chassis hubs.

Until now, wary Chipcom users had interpreted a few minor Oncore enhancements and a long quiet spell as bad news.

But that is changing as 3Com this week rolls out its Oncore Wanna Trade program, new models of the Oncore hub and a raft of low-cost switching modules, according to sources at 3Com.

The new Oncore modules are due to ship in the next several months, along with new switching modules for 3Com's longtime LANplex 6000 chassis hubs, sources said.

The trade-up program gives users with old Chipcom Online hubs $1,000 off an Oncore hub, $500 for each management module and $25 per port for each shared-media hub module, users told *Computerworld*.

Users of rival hub products get $1,000 to $2,000 toward an Oncore hub. The program targets midrange and high-end hubs, including Cabletron System, Inc.'s MMAC and MMAC-Plus hubs, Bay Networks, Inc.'s System 3000 and 5000 hubs, and Cisco Systems, Inc.'s Catalyst 5000 hub.

The 10-slot Oncore costs between $5,295 and $9,995.

Who's eligible

Oncore Wanna Trade also offers discounts for users that trade in hubs from Cabletron, Cisco, Bay Networks, UB Networks, Inc. and Fore Systems Corp.'s Alantec Corp. unit.

High marks

Analysts said the Oncore Wanna Trade program is a smart move.

"This will tantalize the Chipcom installed base and eliminate the perception that the Oncore was being orphaned by 3Com," said John Morency, a principal at The Registry, Inc. in Newton, Mass. "And as far as covering other vendors' hubs is concerned, it looks like 3Com has decided to become a lot more aggressive in marketing."

Morency predicted that only user firms already seriously planning to switch hub vendors will find the $1,000 to $2,000 incentive alluring.

Meanwhile, some Chipcom users said they were excited about Oncore Wanna Trade, which runs until the end of next month.

"We're planning on spending $140,000 to upgrade our 23 Online hubs to Oncore [switches]," said Barry Gillespie, communications supervisor at St. Jude's Children's Research Hospital in Memphis. "And saving $23,000 on that project is a big hit with our chief information officer."

3Com's plan to please its Chipcom user base:

- Launch broad Oncore upgrade program
- Expand Oncore line with low-end, seven-slot Oncore model
- Provide Oncore modules that deliver Ethernet switching at $275 per port
- Provide older Ethernet switches in the interim
- Offer shared-media modules for Oncore users who don't need switching yet
- Announce seven-port Fast Ethernet and two-port FDDI Oncore switch modules
- Promise Token Ring switching for Oncore

Val-Pak Distributing, Inc. is also interested in the Oncore Wanna Upgrade program. "We've got some Onlines and would absolutely be interested in upgrading them to Oncores because the Oncores have a high-speed [Asynchronous Transfer Mode] backplane that is well-suited for heavy traffic loads," said Alan Robson, director of MIS at Val-Pak in Largo, Fla. "We want to move in to the Oncore world, and this an affordable way for us to do that."

Managing reams of data about your network may be getting easier. See page 62.

Patent holder demands slice of online sales pie

By Lisa Picarille

Electronic commerce

A small online distributor in Secaucus, N.J., is trying to capitalize on a 1985 patent that allegedly covers online sales of software, music and data.

Little-known E-Data Corp. claims that anyone who distributes digital data — software, audio or information — for a fee over the Internet is infringing on its patent [CW, Sept. 4].

E-Data's patent, granted to Charles Freeny in 1985 and resold several times before E-Data acquired it in 1995, describes a method whereby users select a digital item from an online catalog, make a payment and download the item to their PC.

On the hit list

Attempting to enforce its patent, E-Data has filed three suits that name more than 50 resellers, content providers and online service and software distributors as patent infringers. E-Data also notified 120 other companies that they are violating the patent. And it sent out more than 75,000 "amnesty packages" that offer infringers a way to license E-Data's patented technology without being sued.

Users aren't liable for infringement, but buyers of online software could pay more for their downloads if online distributors pass on the cost of licensing fees, observers said.

Critics said the patent is overly broad and may not be enforceable.

"Clearly, there are a lot of submarine patents that sit there for a while, and no one enforces them. Then the technology becomes important, so someone comes out to defend them," said G. Gervais Davis, a principal and intellectual property attorney at the Monterey, Calif., law firm of Davis & Schroeder.

Dave Collings, president of InfoOnline, a Redmond, Wash., consulting firm that specializes in electronic software distribution, was more blunt. "This patent is bullshit," he said.

"We believe we are interpreting the patent as narrowly as possible," countered Arnold Freilich, E-Data's president. "If there happens to be broad ramificatioos, then so be it."

E-Data, formerly Interactive Gift Express, Inc., is a publicly traded firm that reported losses in each of the past four quarters.

To date, only two companies named in the suit — CD-MAX, Inc. and MicroPatent Corp. — have used the amnesty program, which runs through Aug. 31. After that, E-Data may file more lawsuits, Freilich said. IBM and Adobe Systems, Inc. settled for undisclosed sums. An Adobe spokeswoman said the Mountain View, Calif., software developer "considered it a nuisance suit."

For big companies, it is often cheaper to settle than to pay expensive legal fees. In turn, the plaintiff often uses the big-name settlements to prod smaller firms to settle.

A hot search engine hits the Web. See page 67.

Red Brick digs in to data mining market

By Dan Richman

Red Brick Systems, Inc. next Monday will become the first relational database management system vendor to announce integrated data mining.

Red Brick Data Mine, which will be built in to Version 5.0 of Red Brick Warehouse, will let users engage in categorization analysis, a form of data mining that deals with the effect of unknown variables on outcomes.

Warehouse 5.0 is set to ship by Dec. 1. It will cost at least $15,000 to buy the license that activates Data Mine, which is built on technology licensed from DataMind, Inc. in Redwood City, Calif.

A categorization-analysis query by a telecommunications company might ask, "What are the characteristics of customers who switch long-distance carriers?" The response might list factors not anticipated by the user, such as spending more than $75 per month on long-distance service, subscribing to a calling plan and living in a large city.

In contrast, a conventional, non-data-mining query asks questions to which the answers are foreseeable, such as, "For customers lost to a competitor, what was the average monthly spending on long distance?"

Users will be able to run traditional and data-mining queries interchangeably against data stored in Warehouse 5.0. No other relational DBMS offers that capability, said Brian Murphy, a senior analyst at The Yankee Group in Boston.

"Being able to do data mining alongside conventional queries would add a valuable piece to our arsenal of analytical tools," said Bob Chin, chief information officer at Healthsource, Inc., a managed-care company in Hooksett, N.H.

"DataMind's technology alone was attractive, but an integration with Warehouse, where we have half a terabyte of medical claims and practice-pattern data, would be compelling," he said.

Corrections

Clarification: Dave Sarna, the head of the VB Large User Group in New York and New Jersey and chairman of ObjectSoft in Hackensack, N.J., was quoted in "Migration to Visual Basic 4.0 stymies corporate developers" [CW, May 20] as saying a lot of people are complaining about VB.

What Sarna said was that some members of the VB User Group had experienced difficulty when going from 16-bit VB3 applications to VB4 32-bit applications when they didn't have the corresponding OCX to a VBX they may have been using. His own experience with VB4 was excellent.

In the June issue of the *Computerworld Healthcare Journal*, a World Wide Web address was incorrect. The correct Web address for the National Committee for Quality Assurance is www.ncqa.org.

Unidata, Inc. is not a licensee of Pick Systems, Inc. A story on Pick in the May 27 issue incorrectly reported that it is.

Micro Focus Challenge 2000 Program

As challenging as it seems, it's a problem that's only going to get more dangerous with time. Today, 20% of business applications cannot handle dates after the turn of the century. By the year 2000 that number will increase to 90%.* Those that aren't converted will fail. The Micro Focus Challenge 2000 Program gives you a comprehensive program of tools and services to fully assess and implement the century date change. Start with the Application Express Offloader™ tool to automatically move the application to a PC. Use Micro Focus' Revolve® Year 2000 analysis tools to inexpensively locate the problem areas. Then, modify the application with Micro Focus COBOL Workbench.® You can even choose to replace your date logic with TransCentury® Calendar Routines. It's quick. It's efficient. It's complete. It's also an effective first step towards reengineering your legacy COBOL applications. After all, fixing a business application should be as quick and painless as possible (right Fido?).

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Merger banks on suite approach

By Thomas Hoffman

One week after The Chase Manhattan Bank N.A. officially merged with Chemical Banking Co. in April, more than 1,500 traders for the combined entity were using the same foreign exchange, derivatives and securities trading systems around the world.

That the new Chase Manhattan Corp. was able to move so quickly was due, in large part, to Chief Information Officer Denis O'Leary's edict that the bank choose integrated software suites instead of individual applications from each bank.

Chase's Denis O'Leary *is banking on software suite selection to streamline consolidation of the merging banks*

In exclusive interviews with *Computerworld*, bank officials explained that their decision reflected the lesson learned in Chemical's 1991 merger with Manufacturers Hanover Corp.: Selecting best-of-breed applications during a merger can be effective as long as the decision-making process doesn't become too granular.

By selecting software suites instead of individual applications, the new Chase has been able to complete the systems selection process much faster than in 1991, even though this year's merger is much larger.

Time is money

For example, it took Chemical and Manufacturers Hanover five months to sift through individual applications for its core financial systems, said Peter Fraedrich, financial director of general accounting operations at Chase.

By picking software suites, such as Dun & Bradstreet Software's E Series general-ledger system, the process took a mere six weeks this time around, he said.

Chase last week announced that to consolidate the bank's core financial systems in the next 2½ to three years, Comtex Information Systems, Inc. in New York will provide information technology services.

Of course, there are trade-offs with the suite selection strategy.

"If a Fortune 100 customer is used to having a special accounting function supported that isn't selected during the systems consolidation effort, you run the risk of losing that customer," said Bill Bradway, an analyst at The Tower Group, a financial services technology consultancy in Wellesley, Mass.

Trading places

The consolidation was further facilitated because Chase and Chemical had upgraded their trading floors in 1993 and 1995, respectively.

As a result, the combined bank already had many similar systems in place. Both trading floors use Sun Microsystems, Inc. Unix workstations: Chase runs its desktops on Sun OS and Chemical uses Sun's Solaris operating system.

Although Chase continues to explore the viability of Microsoft Corp.'s Windows NT workstations, the bank plans to stick with the Sun environment during the remainder of the merger process through early next year.

"We don't want to bicycle and chew gum at the same time," said Anthony Herriott, a managing director responsible for global markets and international bank technology at Chase.

Because both trading floors use Reuters PLC's market data feeds and Teknekron Corp.'s call center switching software, the new Chase should be able to shave $25 million to $40 million off its annual market data and communications costs, said Larry Tabb, an analyst at The Tower Group.

Herriott said Chase hopes to reduce its combined expense base for trading floor operations by 25%.

Best of both banks

Type of system	Foreign Exchange and General Derivatives	International and Domestic Securities and Structured Derivatives	General Ledger and Reporting	Subledger Transaction
Hardware	[illegible]	[illegible]	[illegible]	[illegible]
Bank	Chase	[illegible]	Chemical	Chemical

News Shorts

Online banks get Intuit-ive

Intuit Services Corp. has teamed up with two of the financial service industry's leading processing companies. They will offer more than 1,900 financial institutions online banking, bill payment and other financial services through their existing outsourcing connections. The proposed alliance between the Intuit, Inc. subsidiary, **EPS'** MAC EFT network and **M&I Data Services** would allow those firms to cost-effectively offer online banking and bill-payment information to consumers.

Fidelity offers online access

Fidelity Investment Co. will join the ranks of personal finance institutions that let clients access accounts over the Internet. The Boston company last week said it will allow access to 401(k) and 403(b) retirement accounts through the World Wide Web, beginning in the third quarter. Wells Fargo & Co. and AT&T's Universal Card business unit announced access to accounts through the Internet last month.

DB2 group opens door

The International DB2 Users Group (IDUG) isn't just for DB2 users anymore. Until this year's meeting, which begins in Dallas today, speakers were discouraged from discussing how DB2 can be used in conjunction with other vendors' DBMSs, said IDUG marketing manager Ann Kilhoffer. "IBM is realizing how heterogeneous most sites are and is changing its policy," she said.

Microsoft awaits MQ gateway

In its quest to dress up Windows NT as an enterprise operating system, **Microsoft Corp.** is looking for help from an unlikely source: longtime nemesis **IBM**. Sometime during the next few weeks, Microsoft will announce plans for a messaging middleware product, code-named Falcon, that will let 32-bit Windows applications exchange data via store-and-forward queues. But for linking to mainframes and other back-end servers, Microsoft will rely on a gateway to IBM's MQSeries middleware, which supports 15 platforms including Windows NT. The gateway is being developed for Microsoft by **Level 8 Systems, Inc.** in New York, a systems integrator that resells MQSeries.

MQSeries link delayed

Meanwhile, **IBM** has again pushed back long-promised plans for enabling mobile users to connect to home-office applications via MQSeries. A full Windows 3.1 release of MQSeries due by midyear, along with wireless links and improved dial-up support for the OS/2 and AIX versions, has been put off until the second half. "We had perhaps a rose-colored spectacles' view of how easy it would be to work in the Windows environment," said Steve Craggs, MQSeries business manager at IBM.

FedEx standardizes on HP

FedEx Corp. signed a deal to standardize on **Hewlett-Packard Co.**'s PCs for use internally and at customer sites that run FedEx's Powership automated shipment application. Robert Carter, vice president of corporate systems development at FedEx in Memphis, said the shipping company could buy up to 100,000 PCs from HP in the next three to five years.

CA to manage Money Store

The Money Store, Inc., a Union, N.J., specialty finance company, has standardized on **Computer Associates International, Inc.'s** CA-Unicenter systems management software. The Money Store plans to use Unicenter to manage nearly 150 IBM AS/400-, Windows NT- and Unix-based servers across the U.S.

IBM supercomputer is job 1

Ford Motor Co. will use an IBM RS/6000 SP supercomputer to speed car design, according to **Cornell Theory Center** (CTC) in Ithaca, N.Y., where the computer is located. Ford, a new member of CTC's Corporate Partnership Program, plans to apply the computer's high-performance capabilities to reduce the time it takes to bring a car to market.

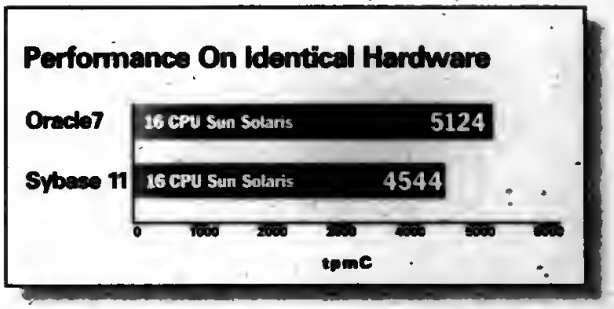
Centura, ADP wrap payroll

Centura Software Corp. last week said payroll outsourcing giant **Automated Data Processing** (ADP) is using Centura's SQLWindows visual development system to build Windows-based front-end applications for its customers. Under the $2.5 million deal, ADP will put a client application called PC/Payroll, built with SQLWindows and Centura's SQLBase database, on the desks of ADP customers. Those clients will use SQLWindows to access payroll information from ADP's servers. About 100 customers are testing the application.

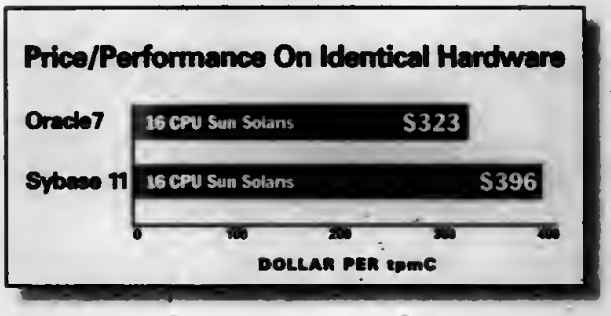
SHORT TAKES **IBM** is ready to ship 16-port versions of its previously eight-port Token Ring LAN Switch and Ethernet LAN Switch.... **HP** announced the HP AdvanceStack Switch 100, a workgroup Fast Ethernet switch with 16 switched Ethernet ports and one 100M bit/sec. port. It costs $3,449.... **Oracle Corp.** plans to launch by the end of the month a groupware suite that includes the Oracle7 database and provides directory services, document management, workflow and other applications for use with Web browsers.

Oracle Universal Server

Faster



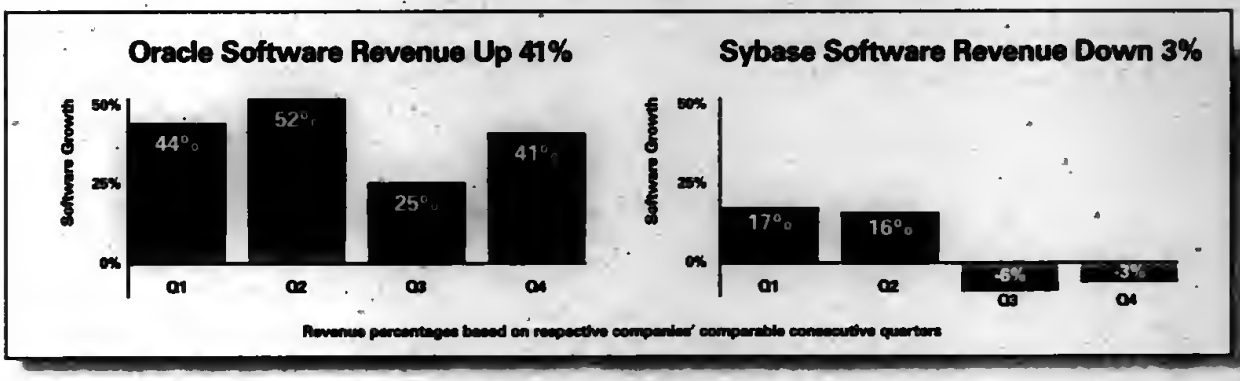
Cheaper



Better

Oracle7	Sybase 11
☑ Universal Server: Tables, Text, Image, Audio, Video	"Sybase which has yet to discuss its plans for such a (universal) server is viewed as lagging in this area." — Network World
☑ Parallel Server: Query, Index & Recovery	"Sybase...has scalability problems with its System 11 release." — Information Week
☑ Concurrent Server: Row-Level Locking	"Sybase System 11...does not support row-level locking." — Information Week

The Market Has Spoken



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Digital to build more OpenVMS/NT bridgework

Users to view second set of links at DECUS show

By Michael Goldberg

Users of Digital Equipment Corp.'s OpenVMS might call it *The Bridges of NT County.*

In its continued effort to build bridges between OpenVMS systems and the growing applications world of Microsoft Corp.'s Windows NT, Digital today will unveil a second wave of products for users who work with both operating systems.

The announcements, part of Digital's OpenVMS/Windows NT Affinity program, will come at the Digital Equipment Computer Users Society (DECUS) meeting in St. Louis this week (see chart).

The Affinity program, announced last year, is aimed at OpenVMS users who are concerned about the proprietary platform's future. The message: Connect Windows NT systems to OpenVMS systems in the data center in a three-tier client/server arrangement.

Digital last December released transaction middleware and application development tools for linking the operating systems.

Digital's second wave

Tool	Description
OpenVMS Management Tools for Windows NT Version 1.0	Manages multiple OpenVMS servers from a centralized Windows NT system
MAILbus 400 Version 2.0	Message transfer agent connects Microsoft Exchange to E-mail systems
OpenVMS Internet Product Suite, Version 1.0	Includes Netscape Communications Server, Commerce Server, Purveyor WebServer and Digital firewall
Application developer package for C and C++	Provides models for making three-tier client/server applications

This week's wave of products includes tools for monitoring both types of systems from one NT workstation, connecting electronic-mail systems and writing client/server applications.

The software products can be obtained as part of the OpenVMS operating system or as stand-alone packages that cost between $99 and $2,000.

"We plan to do this every six months, until everyone is convinced there is a future for OpenVMS," said Wes Melling, vice president of Digital's OpenVMS business.

"I am more convinced about the long-term viability of OpenVMS being able to deliver business value because of this type of effort," said Mark Joyce, supervisor of fiber systems engineering at Corning, Inc.'s Telecommunications Products Division in Wilmington, N.C.

Joyce said his company has already built an OpenVMS-to-Windows NT bridge with application software made available last year. Corning used Distributed Computing Environment tools and client/server software from Forte Software, Inc. to link Windows NT application servers to an OpenVMS server supporting an Oracle Corp. Rdb database.

Brad Day, a senior analyst at Giga Information Group in Cambridge, Mass., said there is a big hole in Digital's scheme: Unix hasn't been part of the NT/Digital coexistence, so far. But he predicted that Digital will integrate its Unix systems with Windows NT in the future.

Success Revolves Around the Net.Engine

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Gates talks turkey about the 'net

Microsoft Corp. CEO Bill Gates was in Boston last week, talking up a storm about — what else — the Internet. He was quoted in a local newspaper as saying that if Microsoft hadn't woken up to the 'net, "eventually Windows would be history." He discussed the Internet and more when he sat down with a group of Computerworld *editors.*

CW: Give us some concrete details about Microsoft's Internet strategy.
Gates: Almost everything we're doing relates to the Internet. The Internet is the standard for how computers are connected together. So every authoring tool you do, every operating system implementation you do, every productivity tool you do — it all ties into how do you take advantage of PCs connected to the Internet. Any week, we have at least three or four events that relate to some aspect of how our software will fit into the Internet.

CW: What are your plans for Internet Explorer?
Gates: We're shipping Internet Explorer 3.0 this summer, which is a major advance for us, and we've articulated how we integrate the browser into the operating system.

CW: What's your opposition to the idea of Internet devices?
Gates: We totally believe in cheaper PCs. What's an Internet device? What's the difference between a diskless PC and an Internet device? It's very hard to comment on zero-volume markets. Is the trend in computing toward better graphics? Better motion/video? Voice recognition? I think so. I doubt people are going to want a device that doesn't do those things.

CW: How are you going to make money on the 'net?
Gates: The notion that you can just have an interactive site which is in and of itself funded — how far you can go and what kind of cost structure you can sustain — is a totally open question. . . . We don't have a goal to have any revenue. All we want to do is have Windows do a good job working with the Internet.

Microsoft CEO Bill Gates: *'We won't make our users ever think about what tools we happen to use to create our software'*

CW: Why are you building Java into your operating system?
Gates: It's not really in the operating system; it's just really a tiny little piece. It's just a language like Visual Basic or C or any of the languages we support. It's a language that a lot of people are excited about. . . . There's a part of Java that's a fad, just like anything associated with the Internet. There are some applications that it's appropriate for, [but] Cobol, C, Visual Basic will still be used, believe me. The world will have many languages.

CW: Is Microsoft going to come out with a suite of applications based on Java?
Gates: This I promise you: When people use our applications, they won't know which part of it was written in Java and which part was written in Cobol or C. We won't make our users ever think about what tools we happen to use to create our software.

CW: Would writing applications in Java enable them to run better on the Internet?
Gates: No. Do you think that the operating systems that run on the Internet were written in Java? I think that 99% of the software on the Internet was written in C. I could be wrong.

CW: Do you think it matters how late applications are?
Gates: We give our customers beta dates so they have some predictability. Is it good to tell customers about the direction you're going in? Yes. Is it appropriate to assign particular dates to that? Rarely because you want the flexibility to take customer input and do quality testing and . . . decide when the right release date is. I can't think of a product in this industry whose success or failure was based on a six-month delta of early or late shipment.

CW: The cost of ownership on the desktop has continued to rise.
Gates: [It] is a serious issue, and we need to keep bringing it down, but cost of ownership has not increased. PCs are better today at doing things. It's just that these tools are being used so aggressively now. Believe me, the cost of software, the cost of management, the cost of ownership has gone down. [This issue] is what we come in every day and think about. When we talk about better software, that's what we're talking about — software that reduces those things dramatically.

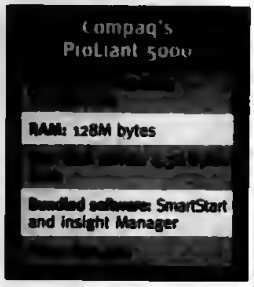
Compaq peddles power Pentium Pro servers

By Bob Francis

Users get to see PC server market leader Compaq Computer Corp. flex its muscles this week when it shows off high-end Pentium Pro servers and enterprisewide systems management partners.

Houston-based Compaq continues to push its way into the heavyweight arena with its new ProLiant 5000, a quad-processor-capable server. It has redundant processor power modules and network cards for reliability.

The system, which ships this month, starts at $21,426 for a single-processor version.



Let's make a deal

In addition, Compaq will announce a partnership with five leading systems management vendors: BMC Software, Inc.; Boole & Babbage, Inc.; Cabletron Systems, Inc.; Seagate Enterprise Management Software, Inc.; and IBM's Tivoli unit.

Under the partnership, systems management products from those vendors will be able to monitor, correlate and act on events generated by Compaq's server management system, Insight Manager.

"Compaq has used its status in the PC server market to bring these systems management vendors around," said John Dunkle, president of Workgroup Strategic Services, Inc.

The other PC vendors aren't sitting still. IBM is tying its Netfinity product more closely with Tivoli's TME 10 as well. And both IBM and Hewlett-Packard Co. will ship new four-processor-capable servers before the end of the month.

Bay opens switched link window

By Patrick Dryden

Network management

Bay Networks, Inc. updated its Optivity network management software last week to let administrators monitor links through switches as well as hubs and routers.

Vendors such as Cabletron Systems, Inc. and Digital Equipment Corp. also offer products for viewing switched connections. But Santa Clara, Calif.-based Bay has made a significant effort to overcome the "notorious complexity" of management tools in this release, according to Brian Burba, a management analyst at International Data Corp. in Framingham, Mass.

Operators who need to drill down to troubleshoot connections will like Bay's intuitive interface to Optivity 7.0, Burba said. "Most management platforms don't let administrators see an accurate relationship between devices this easily, if at all," he said.

However, such products are vendor-specific because the management market is just maturing to the point that users can begin to wrest some control over switched as well as shared connections, analysts said.

Available now, Optivity Enterprise 7.0 offers display and configuration tools designed to shed light on the black holes created in a network map whenever users install switches to boost performance or create virtual LANs.

With this version, managers and troubleshooters can view network connections made through Bay's gear at multiple layers. They can also track the traffic as reported by Remote Monitoring (Rmon) agents embedded in each Bay device or added to the new StackProbe stackable probe.

"We used to require separate tools to manage shared and switched Ethernet and our [Asynchronous Transfer Mode] backbone, and we could see a connection only so far as a switch," said beta tester Nitin Naik, manager for multimedia and telecommunications systems at NASA Classroom of the Future in Wheeling, W. Va. "Now we can follow connections all the way to the desktop from one console."

That is important for this research division of NASA's education wing. Optivity 7.0 helps Naik demonstrate the impact of multimedia applications on a network to planners from a school district and operations staff from firms.

Clear view

Central network administrators at Healthsource, Inc. in Hooksett, N.H., said they need the new version to help them manage traffic flow throughout a network that spans 15 sites as they begin to add switches.

"We like the way Bay will let us look at both the logical and physical connections when we install a switch," said Debby Briggs, WAN consultant for Healthsource. "If someone complains the network is slow, we need to see where the packets are going from switch to switch."

Optivity 7.0 costs $17,995. To help monitor client/server connections through switches, Bay introduced StackProbe, an Rmon probe with four Ethernet ports, for $8,000.

The state of Michigan's network consolidation pays off. See page 59.

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Firms add flavor to Java menu

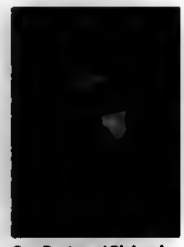
IBM to develop architecture to link OpenDoc and Java

By Sharon Gaudin

IBM is hitching its OpenDoc car to the speeding Java train.

IBM announced last week at JavaOne that it will join several other companies to support Sun Microsystems, Inc.'s Java Beans initiative to set a standard for portable Java applets and applications.

IBM said it will develop Arabica, a component architecture that will tie together OpenDoc and Java. That will create the ability to connect Java applications on the Internet to off-the-shelf applications.



Cue Systems' Richard Kilmer: *Without a tie between OpenDoc and Java, he has to create specific OpenDoc components for each platform*

"This framework really is necessary," said Richard Kilmer, president of Cue Systems LLC, a software development firm in Centreville, Va. "Java itself runs on every platform, and OpenDoc allows me to have those applications interoperate. I'll be able to embed a Java component into a Word document or an Excel document."

Kilmer said without that link between OpenDoc and Java, he has to create specific OpenDoc components for each platform. "Hey, it's going to save me time, money, training and support," he said.

OpenDoc, which has been crawling toward general usage, was designed to be an industry standard architecture for plugging together software components and to create distributed applications.

It was announced three years ago by a coalition of vendors that includes IBM, Novell, Inc. and Apple Computer, Inc.

Java is Sun's increasingly popular development language.

New strategy

IBM only months ago touted OpenDoc as the next great contender for Java's reigning position. Arabica signals more than an obvious end to that strategy, said Judith Hurwitz, president of Hurwitz Group, Inc. in Newton, Mass.

"If OpenDoc is going to be a success, it has to hitch its wagon to a product that has more mindshare than it has right now," she said. "I like OpenDoc, but it just doesn't have much from a visibility and momentum standpoint. So hooking on to Java is a good idea."

Karen Boucher, an object technology market analyst at The Standish Group International, Inc, in Dennis, Mass., said Arabica could be the steam OpenDoc needs in its marketing engine. "It's a great technology, but look at how it's doing in comparison with OLE. It's just not doing well," she said.

One systems manager at a major money center bank said Arabica is just what he has been waiting for. "We build Java applets. Although they're very useful, they don't have any awareness or connectivity with each other," said the bank manager, who requested anonymity.

"[Arabica] really begins to be cost-effective, changing the economics of software development. We can focus on the high value-added components that really solve a major problem for us and then acquire general-purpose components more easily," he said.

Arabica is in prototype now, and IBM plans to begin beta-testing it in the fourth quarter.

JavaSoft's Beans allows reuse of apps

By Lisa Picarille
SAN FRANCISCO

JavaSoft used last week's JavaOne conference here to spill the beans about a new component architecture that will enable developers to write reusable pieces of Java applications that will run within rival component architectures.

Code-named Java Beans, the technology is a set of application programming interfaces (API) that are written in the Java language.

The technology will let users create components and run them within other Java applets and applications, and within non-Java applications, according to JavaSoft President Alan Baratz.

JavaSoft is a unit of Sun Microsystems, Inc. in Mountain View, Calif.

Also on the menu

The Java Beans components will offer Java functionality even when they run within applications that support other component architectures, such as OpenDoc, Hypertext Markup Language and Microsoft Corp.'s Component Object Model.

Java Beans components also can be embedded within applications, generally called "containers," that support other component architectures on a more base level.

These containers include Netscape Communications Corp.'s Navigator and Microsoft's Internet Explorer, Word, Excel and Visual Basic.

Support percolates

Several major developers, including IBM (see related story at left), Lotus Development Corp., Netscape, Oracle Corp., Symantec Corp. and Borland International, Inc., have already announced support for Java Beans as a model for creating open-standards-based components in Java.

James Gosling, a senior fellow at JavaSoft, said Java Beans will serve as an integration architecture that will help bridge disparate component architectures.

Dan Lavin, an industry analyst at market research firm Dataquest in San Jose, Calif., said even though the Java Beans programming interfaces promise integration, it is unlikely that developers will abandon other component architectures.

"Most developers are going to look at Java Beans as an attractive proposition, but the component architecture that most will continue to develop for is the one that has the mass market, and that is OLE," Lavin said.

Support for Java increases, but problems bubbling up

By Frank Hayes

Java is beginning to get the features and support it needs for real corporate development, according to users at last week's JavaOne conference in San Francisco.

But corporate developers also are running into difficulties as they go beyond prototypes when they use Sun Microsystems, Inc.'s Internet development language.

"The area of most concern is security," said Larry Hagerty, a senior systems analyst at the GTE Data Services subsidiary of GTE Corp. in Tampa, Fla.

"We've been struggling over how to interface Java to local applications, and we need more extensive database connectivity," said Leigh Cuthbertson, a Java consultant at Evolving Systems, Inc. in Englewood, Colo.

Security concerns

At the conference, officials at IBM and Sun's JavaSoft subsidiary said they are working to fill those gaps. IBM will create Java connections to DB2 databases and the CICS transaction manager for IBM's VisualAge for Java development system. That system is slated to ship later this year, said Simon Phipps, Java program manager at IBM's Hursley labs in Hampshire, England.

IBM also will give Java applications access to IMS data, probably through its MQSeries middleware, Phipps said. JavaSoft has already developed its Java Database Connection system for Java to connect to relational databases and JavaIDL, a standard interface to object infrastructures that conforms to the Object Management Group's Common Object Request Broker Architecture.

JavaSoft is working on standard interfaces for security, commerce and management that will be finalized in the next 18 months.

Additional structure

JavaSoft also will ship its HotJava framework of class libraries for building portable applications by year's end.

"There haven't been a lot of high-level frameworks for pulling together [Java] applications quickly," said Larry Podmolik, directory of technology at Strategic Technology Resources, a Java consultancy in Chicago. He said frameworks designed for specific industries, such as telecommunications or financial services, are also needed.

Also at JavaOne, JavaSoft announced JavaOS, a version of Java designed for low-cost network computers and other devices.

The company has already lined up more than two dozen JavaOS licensees, including Acer America Corp., Toshiba Corp. and Xerox Corp. But security remains a big concern.

JavaSoft has contracted with outside firms to work on a formal security model in an effort to go beyond its current "penetrate-and-patch" approach in which JavaSoft fixes security holes as they are discovered, said Marianne Mueller, a security engineer at JavaSoft.

Meanwhile, Java is too secure for some applications.

"We need Sun to define a Java socket proxy that would make it politically correct to let people make Java connections through a corporate firewall," said John Gawkowski, a Java software architect at printer R. R. Donnelley and Sons Co. in Chicago. "We keep hearing there's a lot of first cousins to the right answer, but the right answer isn't quite there yet."

Holes keep developers from using Sun's Java in place of other mainstream languages. See page 47.

Elite panel slams U.S. crypto policy

By Gary H. Anthes
WASHINGTON

A highly diverse and bipartisan committee of the National Research Council (NRC) last week repudiated much of the Clinton administration's controversial encryption policy.

The committee, whose study was mandated by Congress in 1993 and whose ideas are likely to be influential in policy-making forums, said the government should freely allow export of encryption that is some 65,000 times stronger than is now allowed.

In a report titled, "Cryptography's Role in Securing the Information Society," the committee also said the government should abandon its crusade for "key-escrow" encryption, which would require users to store the keys needed to decode their messages where they could be obtained by law enforcement agencies.

A sample of the Committee to Study National Cryptography Policy's recommendations

- No law should bar the use of encryption in the U.S.
- National cryptography policy should be developed in open public discussions and should be more user-driven.
- Products using the 56-bit Data Encryption Standard algorithm should be able to be exported.
- The government should encourage encryption for user authentication and data integrity checks.
- The government should promote encryption of cellular communications and better security at telephone switches.
- The government should promote information security in the private sector.

Source: National Research Council, Washington

"The committee concluded that escrowed encryption is relatively untried and entails its own potential risks," said Kenneth Dam, chairman of the NRC's 16-member Committee to Study National Cryptography Policy and a professor at the University of Chicago Law School.

The committee said most controls should be lifted from the export of products that use the government's Data Encryption Standard (DES) algorithm, which is widely used by U.S. banks and others.

The strength of the algorithm, which employs a 56-bit encryption key, has recently been questioned by some experts, but the consensus of the industry is that it will remain unbreakable for the foreseeable future.

"DES meets most commercial requirements," said committee member Raymond Ozzie, president of Iris Associates in Westford, Mass. "But we said products with stronger encryption should be allowed to be exported ... to companies that can show they are willing to allow access to decrypted information on legally authorized request."

The committee recommended the government spend more money on cryptography research and do more to encourage its use in and out of government.

Despite the vote of little confidence in key-escrow cryptography, the committee insisted its recommendations that encourage the spread of cryptography would help law enforcement. "Broader use of encryption will serve to prevent crimes and make our information society more secure," said Edward Schmults, a former general counsel for GTE Corp. and a former deputy U.S. attorney general.

"On balance, this is good news," said Marc Rotenberg, director of the Electronic Privacy Information Center in Washington. "The White House has dug itself into a political hole on crypto policy. This gives them an opportunity, or excuse, to make some policy changes."

Industry leaders slam Clinton's crypto proposals. See page 24.

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IBM will embrace Windows

CONTINUED FROM PAGE 1

and platform announcements there.

Despite the move to embrace Windows, IBM will remain loyal to OS/2, its longtime rival to Windows. OS/2 users probably will see little change in the way software support is rolled out for their platform because the company hasn't indicated plans to move away from OS/2.

"This levels the playing field for OS/2, Unix and Windows and IBM's OS/400 or 390 mainframe users," said Frank Dzubeck, president of Communications Network Architects in Washington. "It will benefit OS/2 users enormously because they'll be able to execute any application on any platform."

> OS/2 users only stand to gain from IBM's open Windows stance.
>
> —Jon Oltsik, analyst, Forrester Research

User benefits

David Kelly, director of application strategies at Hurwitz Group, Inc. in Newton, Mass., said the move could be good for users in several ways.

"IBM has had a lot of experience building mission-critical, large-scale enterprise applications," he said.

"If they're going to be providing their capabilities and tools on the Windows platform, it may allow companies to combine IBM's enterprise experience with Microsoft's dominant desktop orientation," Kelly said.

Joel Diamond, technical director of Wugnet, a Windows user group, agreed that the announcement could be important to corporate users.

IBM "bought a legacy of Windows development and Notes users [from Lotus Development Corp.]," Diamond said. With Windows versions of its software offerings, the company can play to a wider audience, he said.

"Let the customer decide what they want," Diamond said.

IBM is making the change because it doesn't want its software customers to have to think about whether they can run IBM software in a Windows environment, the source said.

"There's no split anymore," the source said, referring to the long-running schism between the OS/2 and Windows camps.

That may concern some OS/2 users. Dan Vermeire, senior technical specialist at Columbus, Ohio-based Huntington Services Co., a division of Huntington Bankshares, Inc., said he has at least 2,000 users who run applications on OS/2.

He said he prefers OS/2 as a custom development environment instead of Windows.

Vermeire said he hopes IBM continues its commitment to OS/2.

"There's certain applications on OS/2 that I'd have a hard time living without. NT is just as strong and robust, but more expensive to deploy. And when you have a few thousand desktops, that's a significant issue," he said.

But John Navas, an analyst at the Navas Group, a consultancy in Dublin, Calif., said IBM needs an aggressive cross-platform strategy for its software offerings. And while it has moved in that direction in the past year, it isn't there yet, he said.

Jon Oltsik, an analyst at Forrester Research, Inc., agreed. He said IBM's decision to openly support Windows across-the-board is an acknowledgement of market realities.

NT Server strategy

Oltsik pointed to several recent moves by IBM that indicate that NT Server is the company's strategic direction:

- IBM's decision to run NT Server on the mainframe. But the computer giant hasn't said it will run OS/2 Warp Server on the mainframe.
- The IBM Power PC-based RS6000 supports NT, but not OS/2 Warp Server, and IBM doesn't plan to support OS/2 on the RS6000.
- IBM acquisition Tivoli has no OS/2 support plans, and Notes' lead platform is NT, Oltsik noted.

The analyst also said IBM can make more money by surrounding NT Server with its applications, such as Notes and DB2, than by promoting OS/2.

Jonathan Roberts, Microsoft Corp.'s director of product management for Windows 95 and Windows NT Workstation, called IBM's forthcoming support of Windows a welcome piece of "great news."

He said, "At some point in time, any vendor, including IBM, has to respond to what customers are requesting."

Vendor parade may march right past expo

By Randy Weston

Comdex/Spring '96, which opens today in Chicago, appears to have lost some of its thunder to PC Expo, which is still two weeks away.

The early forecast of more than 1,100 Comdex exhibitors has now been reduced to about 875. The show is held in conjunction with Windows World '96.

Most industry-leading vendors plan to attend Comdex, but few will make major announcements. At press time, AT&T Corp. was still deciding whether its news was big enough to warrant a press conference. Sun Microsystems, Inc. released most of its big news at the JavaOne conference last week, and Apple recently made headlines with the outline of its new corporate strategy.

What's on tap

Attendees will hear IBM embrace Windows and Microsoft Corp.'s strategy for eclipsing Sun's Java language [CW, May 27]. Sun Chairman and CEO Scott McNealy will deliver his keynote speech Wednesday. Monday's keynote speaker is Netscape Communications Corp. Chairman James Clark, who will outline the company's intranet and Internet market strategy. Tuesday will belong to Microsoft, with Paul Maritz, vice president of Microsoft's platforms group, as the keynote speaker.

COMDEX Spring '96

IBM plans some announcements from its Lotus Development Corp. subsidiary. The main news is that Lotus will start beta-testing its line of telephony products [CW, April 29], including its pager gateway, integrated messaging and Lotus FastCall.

IBM is also expected to reveal details of its planned Lotus Notes Service on the IBM Global Network. The firm has been testing the service since early this year.

Microsoft is expected to announce that it will license the scripting language from its Office application suite. The move will allow software vendors to build support for Visual Basic for Applications directly in to their products and link them with Microsoft's Word and Excel programs.

In the first demonstration of its Pentium Pro-based servers, Digital Equipment Corp. will take its Prioris 6000 server series for a test-drive. It will unveil the 200-MHz Prioris 6200MP and the 166-MHz Prioris 6166MP, which both run Windows NT.

Artisoft, Inc. plans to reveal a version of its LANtastic network operating system that was designed to give small businesses Internet access. The product costs $49 per node for a 10-user software package and comes bundled with Netscape's Navigator, a Winsock gateway that allows several users to share an Internet connection, a TCP/IP stack and access software for CompuServe, Inc.'a Sprynet service.

And Blue Sky Software will unveil Web Office, a package of Web authoring tools for corporate Internet and intranet sites.

Intel's next-generation PCs to let users troubleshoot for themselves

By Bob Francis

Looking to blunt the impact of low-cost network computers, Intel Corp. plans to emphasize new manageability features in its next-generation PCs.

According to Intel, controlling life-cycle costs will put the standard desktop PC in line with the life-cycle costs of network computers now being developed by a variety of vendors, including IBM and Oracle Corp.

The hidden cost

Intel's estimate of the total cost of owning a $2,500 desktop PC

	Current	Future
Processor	Pentium	Pentium Pro
Operating system	Windows 3.1	Windows NT
Price	$9,324	$6,410

The cost of a typical PC is roughly $2,500, and the proposed network computer will cost between $500 and $750.

But Intel estimated the yearly cost of ownership of those systems to be more than $5,000, compared with a Windows NT system at $6,400.

For corporate users, the two computing systems may not be comparable.

"Anything they can do to make it easier to manage PCs is going to help, but I'm not sure these Internet devices are comparable with PCs," said Bart Everett, deputy systems editor at *The Los Angeles Times*. He said there is a world of difference between a general-purpose PC and a diskless device that simply connects to the Internet.

Added software

Intel in Santa Clara, Calif., will include its LANDesk Client/Server desktop management software on its motherboards later this year, company officials said.

The motherboards are used by PC vendors such as Dell Computer Corp. and Hewlett-Packard Co. as the basis for many of their desktop PCs.

The software will let users handle many help desk problems themselves by linking directly with a help desk database over the Internet.

But that won't instantly lower a company's PC costs, according to James Poyner, an analyst at Oppenheimer & Co. in New York. "There's a huge installed base out there that won't have this capability for a long time," he said.

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Antifreeze king ices market with its EDI links

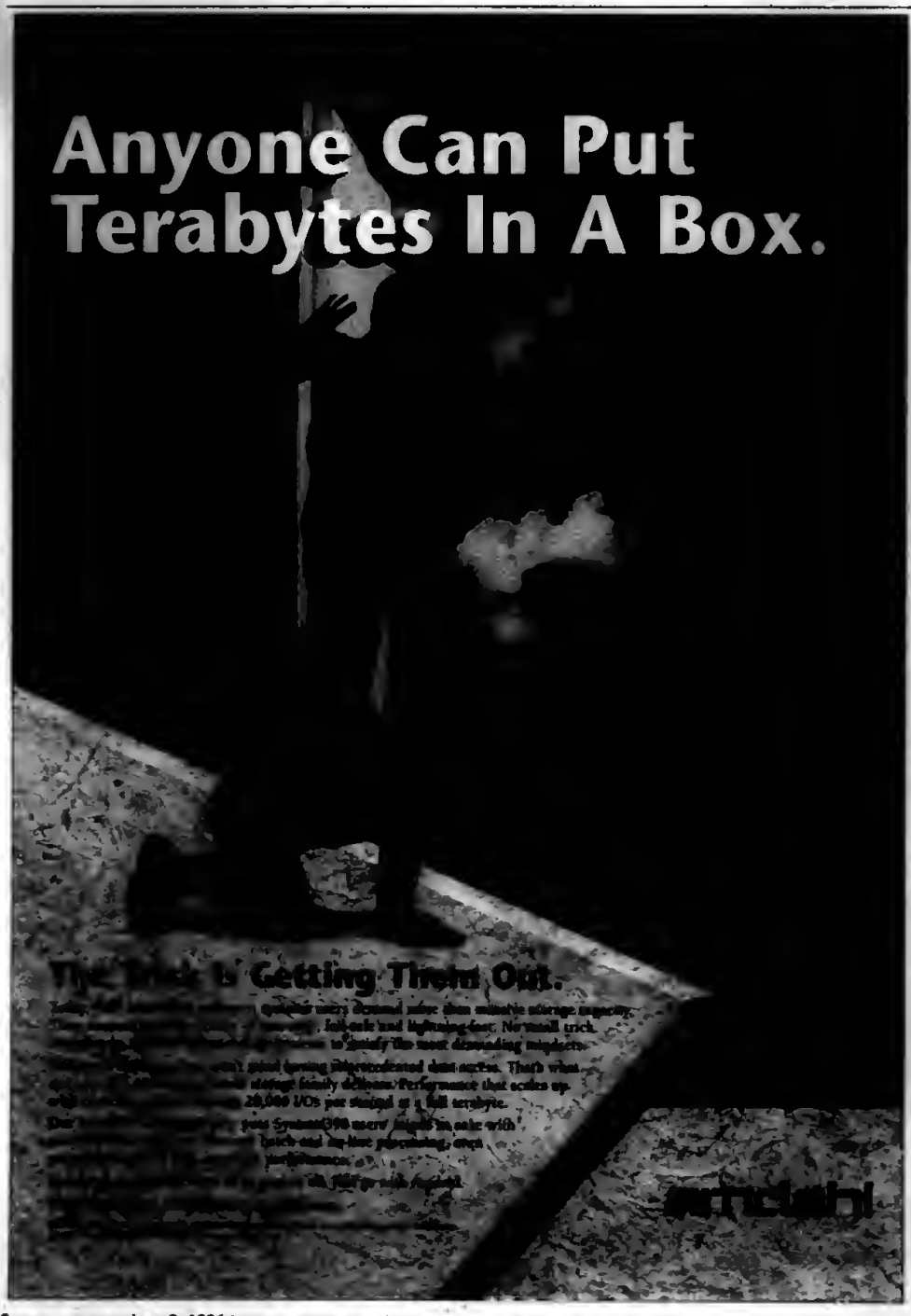
By Thomas Hoffman
DANBURY, CONN.

After Memorial Day, Americans turn their attention to barbecues, trips to the beach, traffic jams and overheated cars.

But Prestone Products Corp. is well-positioned to cool everything from campers to Cadillacs.

For the past 19 months, the antifreeze and coolant kingpin has exploited an aggressive $5 million electronic data interchange (EDI) system to tighten its marketing and distribution relationships with mega-retailers such as Wal-Mart Stores, Inc., Sears, Roebuck and Co. and Kmart Corp.

The EDI links have helped Prestone boost its share of the $595 million U.S. antifreeze and coolant market from 60% to 87% in the past two years.



Before implementing World, a client/server-based manufacturing and distribution system from J. D. Edwards & Co., in late 1994, Prestone processed only 30% of its sales electronically. Today, EDI-based sales account for more than 70% of Prestone's transactions.

EDI links are important because retailers are under pressure to "skinny down" their inventories and move goods through their supply chains as quickly as possible, said Ernest R. Lazor, chief information officer at Prestone, which is based here.

Prestone CIO Ernest R. Lazor: *The company wanted to install an EDI system quickly and efficiently*

Perhaps the biggest challenge of Prestone's EDI project was the short deadline for the core system: 18 weeks.

"A lot of vendors thought we were raving lunatics to try and get a system up in 4½ months," Lazor said. That certainly wouldn't be possible with an elaborate system such as SAP AG's R/3 suite, which often takes years to install, he said.

The World system links 200 Prestone users to the AS/400 via Compaq Computer Corp. ProLiant file servers that run Novell, Inc.'s NetWare Version 3.12.

Prestone's four plants are linked to the system via Sprint Corp.'s SprintNet frame-relay network.

Prestone added several forecasting and planning modules to the system in April and plans to add the final pieces, including carrier freight data and invoice modules, by next March.

Bumpy ride

Those new capabilities should put Prestone in an "elite group" of 100 out of 4,000 suppliers to Sears, said Steve Kraus, director of vendor management at the retailer in Hoffman Estates, Ill.

But the project hasn't been a completely smooth ride for Prestone. Many of the company's end users, who are accustomed to using IBM 3270 dumb terminals, didn't latch on to the new system right away, Lazor admitted. "We had some rocky times with early acceptance, but we expected that," he said.

The situation has since improved. End users are starting to appreciate the system's ability to link disparate departments together — something the former mainframe system never accomplished.

"The old system was very limited," said Bruce Anderson, Prestone's customer service manager. The new system "is helping us look to the future and stay on top of the business."

CBS Radio uses client/server to expand its franchise. See page 75.

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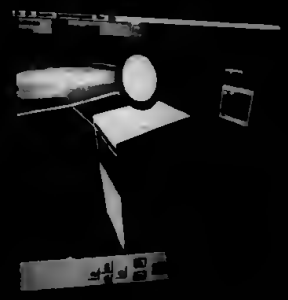

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Industry to Clinton: Drop encryption policy

By Gary H. Anthes
WASHINGTON

President Clinton's recent proposal for a national encryption policy may be declared dead on arrival, if industry reaction is any guide.

In a letter to every member of Congress, eight computer industry CEOs recently blasted the Clinton administration's apparent refusal to give up control of the export of strong encryption and to change its proposal to hold users' cryptographic keys in a special "escrow" account.

The letter strongly supports three bills pending in Congress that would sweep away most encryption export controls. The bills would also knock the teeth out of any key-escrow policy (see chart).

"Our customers tell us they do not want, and will not buy, software with such a government-mandated system," said the CEOs of Novell, Inc., Oracle Corp., Microsoft Corp. and five other companies.

The policy comes from a May 10 draft paper that outlines policies it says would balance users' demand for the strongest security with the government's need to wiretap and carry out intelligence activities.

The paper details a proposed international Key Management Infrastructure (KMI) to be developed jointly by the government and industry. The KMI would use public key cryptography to ensure user authentication, confidentiality and data integrity in a very large community of users.

"This proposal is a nonstarter," said Rep. Bob Goodlatte (R-Va.). "It's just a back-door approach for more big-government intrusions into every American's privacy."

The Electronic Privacy Information Center in Washington said the KMI would be "relatively easy" to defeat by determined hackers, who would then gain access to confidential information.

Crypto Congress

Legislation pending in the House and Senate would:

- Prohibit the mandate of key-escrow encryption and federal cryptography standards for the private sector
- Allow the sale and use of any kind of cryptography in the U.S.
- Allow the unrestricted export of cryptographic products if products with comparable security are available from foreign suppliers
- Set up procedures for law enforcement to obtain decryption keys from key-escrow agents
- Make it unlawful to use encryption to commit a crime

Source: Business Software Alliance, Washington

Despite the criticism, the administration proposal makes strides in meeting users' objections to the Clipper chip proposal of three years ago. Clipper-based encryption systems would have required users to put their private encryption keys in escrow with a federal agency, and law enforcement agencies could obtain the keys when needed for decoding wiretapped messages.

"I think this is a good compromise," said Dorothy Denning, a computer science professor at Georgetown University in Washington and a prominent supporter of the key-escrow concept. "But now industry is saying, 'If only we can get those bills through [Congress], we won't have anything to worry about.'"

National Research Council urges changes in encryption policy. See page 15.

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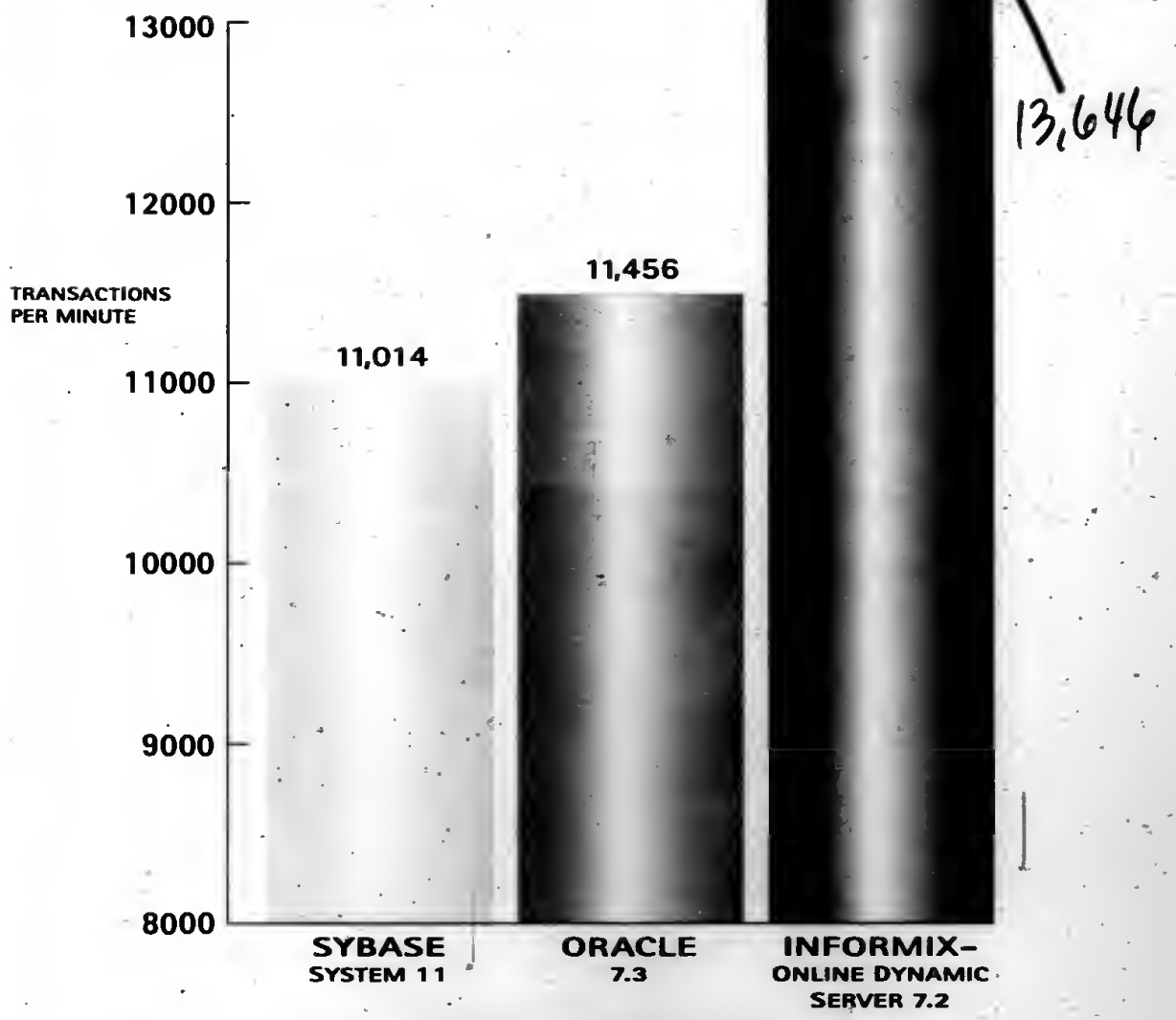

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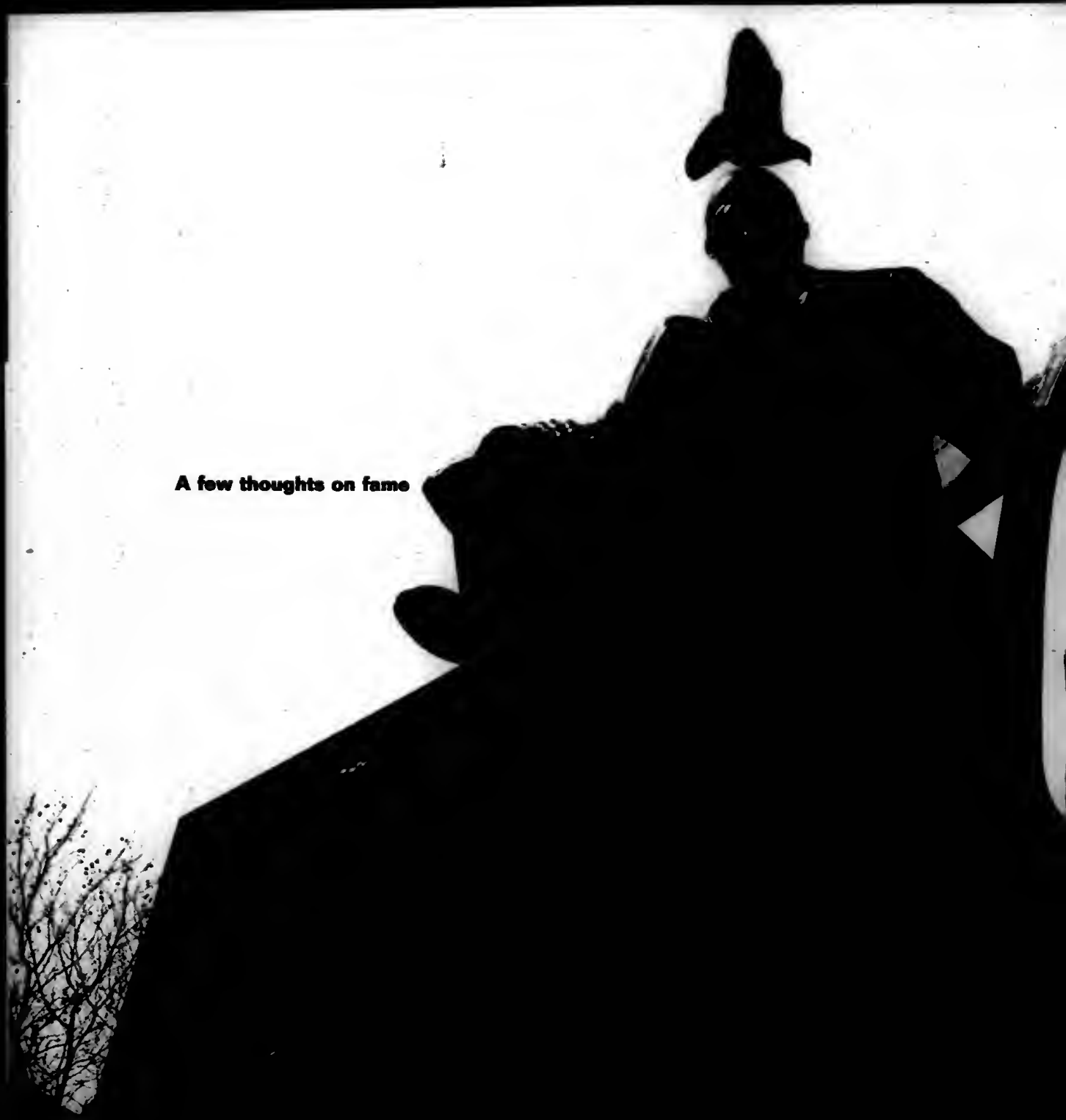

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Self-help

CONTINUED FROM PAGE 1

said Carter Lusher, an analyst at Gartner Group, Inc. in Stamford, Conn.

But most corporate users aren't so resourceful. Lusher estimated that only about 10% to 15% of corporate users would be comfortable browsing for help themselves. The rest continue to call corporate help desks at a cost of $2,743 per user per year.

That's why self-service is a flawed concept, according to Steve Hammersly, president and CEO of Utopia Technology Partners, a help desk software company in Larkspur, Calif.

"Self-service is a nice idea, but in reality, it is like taking an aspirin for a brain tumor. It's not really attacking the problem," Hammersly said.

"Some people just don't think it's their job to solve their own hardware and software problems," said Paul Foley, associate director of information systems technical services at Readers Digest Association, Inc. in Pleasantville, N.Y.

Some also question whether it's really a wise use of a highly paid professional's time to be surfing the World Wide Web in search of hardware and software information.

"Salespeople, for instance, just want a system that works. They want to enter their orders, go on to the next thing and sell, sell, sell," said Laurel Bailey, director of Hilton Hotel Corp.'s 20-person internal support center in Las Vegas.

"They don't want to learn anything from their call to the help desk, even if it's something they could fix themselves the next time," Bailey said.

Users at Aetna Insurance Co. in Hartford, Conn., already have the answers — some in manuals — to about 85% of the questions they ask the help desk, according to Karen Kocher, manager of technical training.

"A lot of this information has always been there, but [users] never used it," Kocher said. And self-help programs over an intranet won't take off unless people are forced to use them, she added.

But an entirely different story is beginning to play out at consumer-oriented help desks that serve technology-savvy users of computer-based games and productivity packages.

Here, the promised benefits of self-help are beginning to pay off, according to help desk managers.

At Aimtech Corp., an $11 million multimedia authoring software firm in Nashua, N.H., more than 90% of users who visit the company's Web-based help desk find their own answers to problems.

"Only about 10% have to submit queries after they go to the site, so we see a lot of savings in the amount of time customers have to wait for an answer," said Bill Levesque, the company's vice president of customer service.

No new hires

Because customers are dialing in to a Web site rather than a traditional support center, "we won't have to hire more people to staff help lines," Levesque said. This should translate into a 20% to 30% savings in customer support costs.

At Buffalo, N.Y.-based UCA&L, Inc., which provides technical support to customers of high-tech companies, including Intuit, Inc. and Microsoft Corp., self-help comes in the form of electronic-mail access to the company's help desk operations.

"The acceptance rate of using technologies like this started at the guru level, but now we're finding acceptance from a midtier of technology users," said Paul Bandrowski, the company's chief technology officer.

For example, instead of waiting for support for a Microsoft Word or Excel package, users will check the Web site and see if anyone else has had the same problem, he said.

"If they had picked up the phone and called, they would have been waiting in a queue on hold [because] the average answer speed in the industry is abominable — over 12 minutes," Bandrowski said.

UCA&L's Paul Bandrowski: *Average phone response time is over 12 minutes*

Are calls to your support organization increasing or decreasing?

Base: 1,014 help desk managers

Source: The Help Desk Institute, Colorado Springs

IS staffers can get 'net based training for Microsoft products. See page 76.

Apps aid tech samaritans

Comprehensive packages cut systems integration chores

By Julia King

Help desk software vendors are saving users from some tedious systems integration work by bundling their tools into more comprehensive, preintegrated offerings.

The trend promises to save users both time and money because the bundled packages sell for much less than their component pieces.

This week, for example, ServiceWare, Inc., a packaged knowledge vendor in Pittsburgh, will begin to ship its new Knowledge-Pak Desktop Suite to 13 other help desk vendors. These vendors will incorporate the software suite into their own products.

Popular knowledge

The new suite comprises 15 knowledge bases for popular applications, such as Word and Notes.

Pricing on the bundled suite has been cut by 90%, according to ServiceWare President and CEO Jeff Pepper. However, companies that purchased one or more packs individually before this week can upgrade to the full Knowledge-Pak suite through ServiceWare for $500, he said.

Earlier this year, Inference Corp. in Novato, Calif., cut a similar bundling deal with six help desk vendors. Those vendors include Utopia Technology Partners, Vantive Corp., Workgroup Systems Corp. and Bendata, Inc. All of these vendors' products now include Inference's case-based reasoning tools for searching knowledge bases.

"There's going to be more and more movement toward integration, which makes sense because help desk vendors should really be solution providers rather than technology providers," said Carter Lusher, an analyst at Gartner Group, Inc. in Stamford, Conn.

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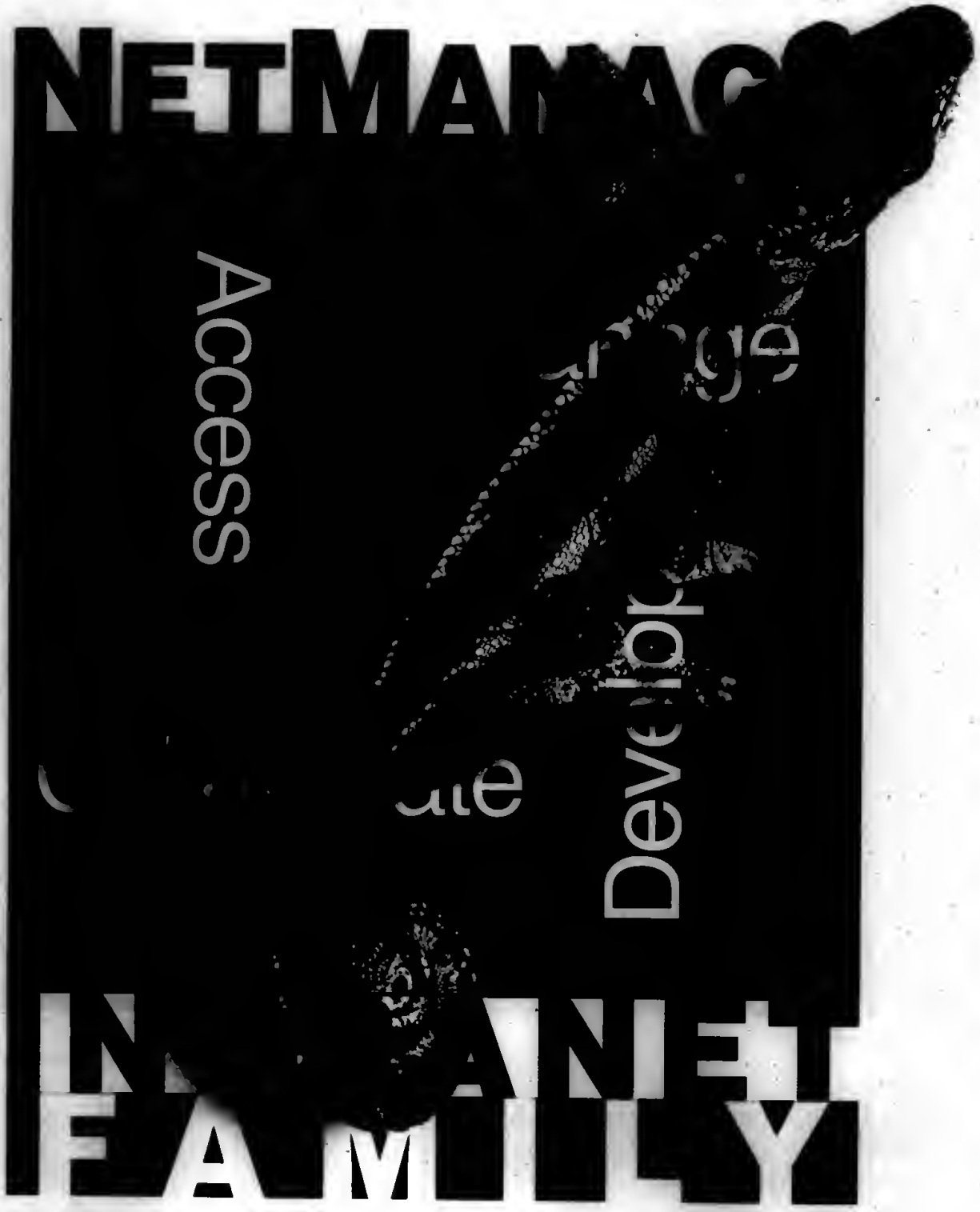

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Briefs

Novell posts loss

Novell, Inc. is still finding it hard to get off the ground, despite jettisoning $225 million in excess baggage during the quarter ended April 27. The firm reported a $55 million loss, compared with a profit of $95.8 million last year. Revenue for the quarter was $188 million, down 68% from $530 million for the same period last year. In March, Novell sold its line of personal productivity applications to Corel Corp. for $20 million. The company attributed its quarterly results to the $225 million inventory reduction program and the sale to Corel.

TI CEO dies

Jerry Junkins, chairman and CEO of Texas Instruments, Inc., suffered a heart attack and died while on business in Europe last week. Junkins, 58, had led TI for 11 years, during which time the company doubled its revenue and strengthened its overall market position. TI's board named Pat Weber, one of two vice chairmen and a member of TI's office of the chief executive, as acting president and CEO. The board is searching for a successor.

Visigenic stocks up

Middleware vendor Visigenic Software, Inc. will collect up to $8 million in cash from purchases of its stock by three other vendors, company officials said last week. Cisco Systems, Inc., Netscape Communications Corp. and Platinum Technology, Inc. completed purchases of a special issue of stock by June 1. The companies said they want to support Visigenic's continued development of Open Database Connectivity and JDBC drivers and object request brokers for use in their network management products, intranets and data-access tools, respectively.

It's time to pay up

Many default on PCS license payments

By Mindy Blodgett

The winning bids at this month's government auction of personal communications service licenses totaled a whopping $10.2 billion.

But Uncle Sam is already having trouble collecting.

For example, BDPCS, Inc., a start-up unit of Questcom, Inc. in Portola Valley, Calif., has defaulted on its payment agreement with the Federal Communications Commission.

Wireless auction

The company's bids for the 30-MHz C-block spectrum — set aside for small business vendors — totaled $874 million. The company missed a deadline to pay 5% of its total bids, and the FCC has denied the company a waiver.

The FCC is auctioning off parts of the radio spectrum to vendors that want to offer personal communications services (PCS). PCS networks will offer wireless voice and data transmission — including electronic mail and paging — to users. PCS is expected to offer stronger and less expensive connections than current cellular and wireless technologies.

For companies that default on their payment obligations, the FCC could levy fines, seize the licenses and either conduct another auction or award the licenses to the next-highest bidder.

But Robert Kyle, CEO of BDPCS, said the company still seeks a waiver. He said the company hopes to build 17 systems, including ones that cover Seattle, Phoenix, Minneapolis and Denver.

Many defaults expected

Another company, National Telecom PCS, Inc., also seeks a waiver for payment, the FCC reported. With another deadline for a 5% payment looming, industry observers said there may be more defaults.

The problem could be the astronomical bids, industry analysts said.

"I don't know if the market can sustain these types of [high] bids," said Iain Gillott, an analyst at IDC/Link Resources in Austin, Texas. "And the problem for these recent bidders is that the guys who went after the A and B bands were established brand names."

Last year, the A and B PCS blocks were auctioned to large carriers such as Sprint Spectrum, PCS PrimeCo LP and AT&T Wireless Services, Inc. for a total of $7.7 billion.

These giants have the advantage of a year's head start in building PCS networks. Sprint Spectrum has already launched its service in the Washington area, and AT&T Wireless is gearing up to have PCS service available early next year.

Top bids in the FCC's broadband PCS spectrum auction [illegible]

Company	Bid
NextWave Telecom, Inc.	$4.2B for 56 licenses
[illegible]	[illegible] for 43 licenses
GWI PCS, Inc.	$1.1B for 14 licenses
[illegible]	[illegible] for 17 licenses

Laptop theft is rising but not necessarily in ways you would expect. See page 39.

Vendors ready blizzard of 'net devices; users prepare to shovel through hype

By Bob Francis

Users eyeing the online world may find it difficult to sort through the growing variety of Internet-access devices.

Despite a hyped introduction recently by Oracle Corp., IBM, Sun Microsystems, Inc., Apple Computer, Inc. and Netscape Communications Corp., not everyone plans to back specifications for the Network Computer (NC).

The $500 NC is billed as a low-cost alternative to PCs loaded with programs. Many NC systems will be offered to consumers, but some companies, such as Sun, are planning versions for the corporate market. Those systems will likely cost about $750.

Compaq Computer Corp., the Houston-based market leader in PC hardware, is staying away from the Internet-specific device, as described by Oracle.

Compaq officials said the company doesn't believe NC systems offer much value to users at the moment. But Compaq does plan to push Internet connectivity in current and future products.

Another option

Other PC vendors, such as AST Research, Inc. in Irvine, Calif., are promoting low-cost PCs as Internet-access devices. Those systems, which would cost less than $1,000, are aimed at the home market.

"I really want to see what they can do and how we might use them."

— J. Matthew Merrick, vice president, Merrick Publishing

And other vendors are opting to retrofit X Window System terminals as network appliances. Those systems, which would cost about $750, are for corporate users who want to connect to the corporate network and the Internet.

International Data Corp. in Framingham, Mass., predicts that about 95 million Internet-access devices will be sold worldwide by 2000. But most of those will be PCs or Internet PCs, not strictly Internet-access devices, according to the research firm.

In any case, users seem ready to kick some tires. "I really want to see what they can do and how we might use them," said J. Matthew Merrick, a vice president at Merrick Publishing, Inc. in Louisville, Ky.

Merrick will have a lot to consider. Take HDS Networks System, Inc. in King of Prussia, Pa., for instance. The X terminal manufacturer this month will ship a network computer designed for corporate applications and World Wide Web browsing. The system will cost about $750 and will include Sun's Java programming language, a Hypertext Markup Language interface, a keyboard, a monitor and an Ethernet card for network attachment.

"We're not going to use the reference platform," said Michael Kantrowitz, an executive vice president at HDS. "We believe that's a single-function device and that corporate users will want to do more than just surf the 'net."

Greg Blatnik, an analyst at Zona Research, Inc. in San Jose, Calif., agreed. "Based on our research, corporate end users believe they need access to other applications [besides] the Internet, such as their Windows applications," he said.

Toward that end, the HDS box includes software that will let users download applications from a server — a key difference from the NC.

The Acer Group, which supports the NC standard, is releasing a sub-$500 PC overseas, which it could also market domestically. "Vendors are probably going to try a variety of different ways to see what's going to work because this market is so untested," Blatnik said.

NT-based desktop machines are on the way. See page 39.

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Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) Net/Ware

Ann. Dev. Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries? (Select only one per column.)

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C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
J. 10 – 19	❑	❑
K. 1 – 9	❑	❑

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60. Government - State/Federal/Local
69. Communications Systems/Public Utilities/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D. Tech. Mgmt.
60. Sys. Integrators/VARs/Consulting Mgmt.

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B. 10,000 – 19,999	❑	❑
C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
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"We had it up and running before management even knew about it."

"They were sold on the technology and wanted to try it."

"Because it's not that much money."

Those are the voices of your colleagues, explaining to *Computerworld* — in our recent survey about intranets — why they didn't have to cost-justify their projects. We wondered, in the midst of the rush to intranet technology, who was minding the online store? Were IS professionals running into return-on-investment roadblocks? The surprise is that most intranet projects — 63% of the 100 sites we surveyed — didn't have to worry about ROI. And about 57% of our respondents had intranets in production or in the planning stage.

Indeed, companies are finding seriously useful work for these internal networks, which rely on public Internet technologies such as Web browsers, search engines and TCP/IP networks.

But how did these IS folks escape the bean counters, at least in the short term? They took advantage of very low-cost software. They recycled hardware. They leveraged the burgeoning skills of wanna-be webmasters in their firms. And they cashed in on that "gotta have it" feeling that is sweeping corporate boardrooms.

So what's on these intranets? Companies use them to post everything from policy manuals, sales guides and electronic bulletin boards to local weather reports, cafeteria menus and internal job listings. If you're curious about what intranet users are talking about, check out the first moderated Web discussion group on the subject at www.brill.com/intranet/ijx.

One user at the site described her firm's "Today Page," which contains resources such as FedEx and UPS package tracking, news headlines, local traffic conditions and PC user documentation.

Of course, the honeymoon will end once the small departmental intranet projects become companywide applications. The ups and downs of cost-justifying intranets will be the theme of the premiere issue of *Computerworld Intranets*, which will be bundled with the June 24 issue. This eight-page minimagazine, with a print and online presence (www.computerworld.com), will concentrate on quick-hit, useful information for managers grappling with a variety of intranet decisions.

For example, the chief information officer at Trans Ocean Ltd. in San Bruno, Calif., sent his IS staff to intranet classes at a local university. "I no longer have to use consultants," the CIO explained. Chalk that up as Cost Justification No. 1.

Maryfran Johnson, *Executive Editor*
Internet: *maryfran_johnson@cw.com*

Managing the good, the bad and the weirdos

Editor's note: *When we ran our story about how to manage brilliant but eccentric — even downright weird — IS professionals ("Weirdos," CW, May 13), we invited readers to forward their suggestions . . .*

Do you ever wonder why businesspeople look down on IS professionals? How many accountants, marketers, etc. are allowed to be weirdos? Take your example of Rich the bicycle rider. It seems Rich was fired for almost running down the chief operating officer while riding his bike through the halls of the office. Then Rich was rehired with a raise because only he could keep a system running.

I would have fired the IS manager for allowing a mission-critical system to depend on one person, especially a nutcase like Rich. There are many capable IS people who would take great pride in supporting a system that can function properly without having their hands on it constantly.

The article mentioned application developers who would not attend meetings. How do you discuss requirements with customers or other team members? I apologize to all you potential weirdos, but I want applications written that can be maintained by people other than the ones who wrote the original code.

We do not need uncommunicative hermits who cannot relate to the rest of the human race. What we need even less are managers who accept this type of behavior.

W. P. "Doc" Holiday
Leading Special Projects, Inc.
Crestview Hills, Ky.
GVBD43A@Prodigy.Com

Every month I publish the Computer Services project list. This includes the steps [in each project], whom each step and project belongs to, and the milestone dates. So long as these dates are met — or there are reasonable justifications why they are not — and no one gets hurt by eccentricities, all is well. In other words, I outline the job, and they have input to fine-tune the outline and then just get the job done. How they do it is up to them.

Stephanie Klima
Transplantation Society of Michigan
Ann Arbor, Mich.

Weirdos

The downside of having a "Rich" is not his eccentricity but his near-absolute control over the company's online system. As an alumnus of the U.S. Navy, I would like to mention a minor problem with that — death.

Rich could just as easily have been "downsized" by a Mack truck and rendered unavailable for rehire at any pay. Military organizations have to plan for the inconvenient demise of key personnel. Without cross training, the unit might not survive. I am glad there is room in corporate America for the outlandish genius, but maybe we should ask ourselves, "What would I have done if one of my key people had been on that ValuJet?"

Dan Lynch
Lynch Associates
Jamaica Plain, Mass.

I have a guy who looks like a normal guy, except he works 18 hours a day, sleeps at the company on weekends, helps his colleagues and always has an answer to every problem. His biggest asset is his people skills. He is the most in-demand employee at our 200-employee company. Everyone loves this guy, and he is one of the most intelligent people I've ever known. Yet he is kind of weird.

He earns a lot of money, isn't married, drives a motorcycle and uses the company's facilities on weekends as a racetrack.

No one in management denies him anything; we let him have his way. But we are very strict about setting deadlines. If we let him set it, he would probably say, "Tomorrow."

Enzo Marsicovetere
WL Central America & Panama
Guatemala

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Verbatim

From a statement by Nic Richardson, a marketing manager at Kaiser Permanente Health Plan, Inc. in Southern California, about databases for targeted marketing:

Growth for us means looking where competitors don't look.

Conventional marketing wisdom has companies focusing on customers that buy their product, understanding [those customers] and trying to find more customers that fit this profile.

However, it is possible that this existing market might be tapped out.

One huge opportunity companies miss is to really understand the potential customers who nearly bought their product. Through effective database marketing, companies can learn why potential customers didn't buy their product and learn what it will take to "tip them over" next time, thereby opening up an entirely new market.

From a summary of "Notes' Survival in the Intranet-Enabled Corporation," a study conducted by Input, Inc., a market research firm in Mountain View, Calif.:

Lotus [Development Corp.'s] Notes has two years left as a dominant groupware product.

The end of 1998 will be a critical milestone in the groupware market.

Notes will be completing its transition to the [World Wide] Web, and Internet groupware will be catching up with Notes' functionality.

There is great interest to "Notes vs. Internet," but the real issue lies elsewhere. "Notes vs. Internet" compares application with platform, not application with application. Notes will compete against groupware applications written to run on the Internet platform, such as Radnet's WebShare and Action Technologies' Action Workflow Metro.

By the end of 2000, Internet groupware will have overtaken Notes with 32 million users, compared with Notes' 26 million.

Gilligan's Island reruns on hold?

Bruce Hoard

The Telecommunications Act of 1996 has already had an amazing effect on the networking market. For example, consider the news about incestuous relations and mergers between the erstwhile Baby Bells. If they made a movie about the results of these ungodly liaisons, the title would have to be something like *Rosemary's Baby Meets the Fly*. Take my word for it, folks, this is bad juju. So, as a public service, I offer the following answers to your most pressing questions about this landmark law.

The telecommunications reform act has saved us from telework distractions and string-and-can technology.

Q: Does passage of the Telecommunications Act of 1996 mean a return to string-and-tin-can (S&T) technology?

A: Absolutely not. S&T technology has given way to 10-pound fishing line and plastic ricotta cheese containers. We expect this breakthrough technology to revolutionize local loop communications and, more important, spur on lasagna consumption.

Q: Is it true that the Telecommunications Act of 1996 requires cable television companies to install a special chip in home receivers that prevents reruns of *Gilligan's Island* from being transmitted during daylight hours?

A: Yes, it is true. The thinking is that unlimited access to *Gilligan's Island* would undercut the rapidly burgeoning telecommuting trend by distracting home workers.

Q: Is it true that MCI and AT&T are thinking about teaming up to offer local service? If this happens, will they stop running negative TV ads about each other?

A: Even though MCI and AT&T are exploring the idea of jointly offering local service, they have made it clear they maintain a cringing dislike for each other and plan to intensify the already strident tone of their attack ads. In fact, MCI has reportedly hired former presidential candidate Steve Forbes' advertising guru to do to AT&T what he did to Bob Dole in New Hampshire.

Q: How will deregulation impact the availability and price of Integrated Services Digital Networks (ISDN)?

A: Not to worry. ISDN will still be rolled out arbitrarily at a glacial pace, and prices still will rise rapidly.

Q: Is the underfunded, understaffed Federal Communications Commission prepared to write all the rules required to implement deregulation?

A: That remains to be seen. The agency has already come up with a few: Cable TV companies won't be allowed to enter the lucrative local pizzeria market. And all top managers at the Baby Bells and major long-distance carriers will have to attend charm school before negotiating terms that open the local loop to outside competition.

Q: Isn't it great that the old Baby Bells, such as Bell Atlantic and Nynex, are getting together again to offer long-distance service?

A: You bet. When it comes to forward thinking, this kind of reunion ranks right up there with the return of communism to Russia.

Q: There is an inside-the-Beltway rumor that Congress sold the movie rights to the 280-page Telecommunications Act of 1996 to a Hollywood studio. Insiders say the studio will cast Jim Carrey as FCC Chairman Reed Hundt. True or false?

A. True. Tentatively titled *Ninja Telecom Dude*, the madcap comedy features a gyrating Carrey, wildly roaming the halls of Congress, giving hot-foots to senators and passing gas as he begs for more resources at the FCC.

Hoard, a former staff writer at *Computerworld*, obviously has too much time on his hands. His Internet address is bruceh6687@aol.com.

Plato was right: Classification matters

Melissa Cook

Sometimes it's hard to admit we're not the only generation that has needed to process information. We tend to think that information processing started with the vacuum tube or the microprocessor. But it actually started in the days of the ancient Greek scholars Plato, Aristotle and Theophrastus.

A good classification scheme gives IS a logical blueprint for technology deployment.

As information architects, there is a lot we can learn from the Greek scholars. They, too, were trying to figure out how to simplify the sometimes daunting task of information processing. To do that, they pioneered a field we now call "classification theory," a precursor of object orientation.

In essence, classification theory means sorting similar objects into groups. It's one of the first skills we learn in kindergarten. Plants, animals, colors, minerals and all sorts of things are classified so that we can better process information about them. But this same skill is one of the first things we forgot when we built the morass of legacy systems we have today.

Without a good classification scheme, your brand-new corporate information architecture will be just like your old one — riddled with complexity, redundancy and information flows that look like a dropped plate of spaghetti.

Classification begins with rounding up all the business processes that are related to one another and calling them "process classes." Then round up the similar data, create "data classes" and map the process classes to the data classes.

For example, customer order data should be associated with the order-processing activity. There's no sense getting customer orders mixed up with marketing data or getting manufacturing processes mixed up with accounting processes.

In the end, you have a suite of clearly defined enterprise "information systems," or logical groupings, that would make Plato proud. But these "information systems" don't have anything to do with technology yet. Frankly, this is an exercise intended to clarify your thinking about business processes and information before you ever start adding technology.

This isn't something to be done by a bunch of technophiles. Hospital administrators don't classify the world's diseases, and technologists shouldn't classify business processes and data. Instead, use experts in business units.

If you apply the classification theory to the corporate IS architecture, you'll have a business-driven, architectural plan for technology deployment. When replacing big, complex legacy systems, the plan will show your designers how to carve those behemoths into more manageable projects.

Furthermore, systems based on a classification scheme have less redundant software and data. They're less complex. The process of classification can even identify business processes that need to be streamlined.

Is this just a futile exercise in paperwork and meetings?

If done correctly, the whole process takes just a few months and produces a powerful product: a solid foundation for all your IS projects. It's like creating a blueprint for a new house that shows the builders where the rooms should be — and keeps the builder from putting the shower in the living room.

Plato was right about the importance of classification theory. The famous German philosopher Friedrich Nietzsche once said, "Plato is a bore." But he was wrong.

Cook is manager of the corporate marketing information systems architecture at Hewlett-Packard Co. in Palo Alto, Calif. She is author of *Building Enterprise Information Architectures* (Prentice-Hall).

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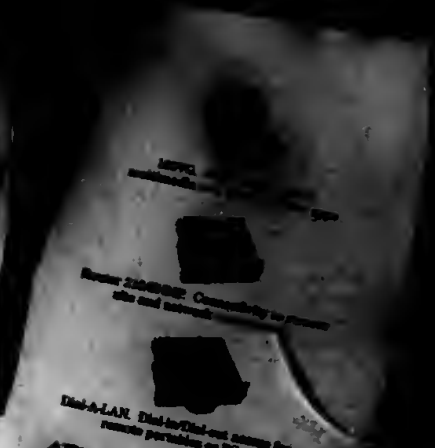

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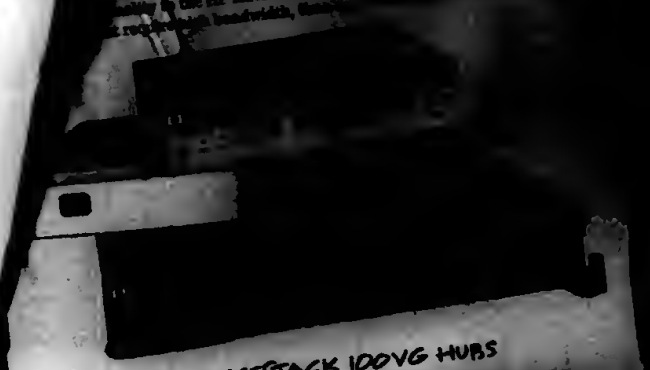

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Storage Computer's Storage SuperServer

Start-up's arrays offer steady performance

By Michael Goldberg

They may be small — only $23 million in sales — but the open systems disk arrays from Storage Computer Corp. pack a technology punch worth watching, users and analyst agree.

With the Storage SuperServer due out this month, the Nashua, N.H., company is making it easier for users to connect several Unix or Windows NT-based computers to a common storage system that offers high performance and reliability, observers said.

"Everybody's trying to solve this problem, but it's only EMC [Corp.] and Storage Computer that are doing it in this market," said Michael Peterson, president of Strategic Research Corp., a storage management market research firm in Santa Barbara, Calif.

Storage systems

The SuperServer uses its own operating system to manage changes to stored data to boost system performance. The use of UltraSCSI channels to computers — at 40M bit/sec. — is another ingredient.

Storage Computer also uses RAID 7 storage technology, a coined term that describes a hybrid combining the fault tolerance of RAID Level 5 and the data integrity standards of RAID Level 4, explained James Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif.

John Amelia, a network designer at a telecommunications firm, said he picked the SuperServer for its ability to handle many thousands of small transactions — 2K-byte writes — in a business application using a Sybase, Inc. database due to reach 360G bytes.

Reliability was also an issue, Amelia said. "We're dependent on the 'hot spare' capability, which is global" across multiple linked storage systems, he said. Defining a storage drive as a hot spare means it will automatically go into service if another disk fails — rebuilding the data stored there.

The Storage SuperServer is also a good fit for the performance needs of Mercury Computer Systems, Inc., said Chris Stakutis, director of business development. Mercury in Chelmsford, Mass., develops video editing servers for film and video editors in postproduction work.

The SuperServer "allows us to support many extremely high-bit streams simultaneously, and the view that the [array] presents to our computer is one big disk, even though there are lots of disk drives involved," Stakutis said.

Laptop theft on the rise

By Mindy Blodgett

For months, everyone from the Federal Aviation Administration to the Road Warrior Alert, an online mobile workers service, has issued warnings on the rising risks of notebook theft.

Road warriors seem to have gotten the message about laptop theft, but workers left in the home office apparently haven't.

"Our claims reps notice that about one in 10 thefts is from airports or some other form of travel," said Charles Drake, a spokesman for Safeware Insurance Co. in Columbus, Ohio. "But we are guessing that three or four out of 10 are stolen out of offices."

The problem is growing. Notebook thefts rose more than 30% in 1995 from the previous year, according to Safeware.

"It's just common sense that something light and small would be a target of theft," said Margaret McIsaac, technology officer at Canadian National Railways in Montreal.

Michael Radigan, program manager at Xerox Corp. in Rochester, N.Y., agreed that office thieves are a continuing concern.

"Our biggest fears are internal," Radigan said. "We had real problems in our Denver office, to the point that we had to bring the police in and issue lots of warnings. That seemed to stop it."

Drake said most companies insure laptops for their employees. But he said some companies are moving toward a system in which they pay for deductibles but mandate that em-

Notebook thefts, *page 41*

Avoid being "lapjacked"

- Use an encryption software program so thieves can't read files
- At airports, don't put your laptop on the conveyor belt until you are the next in line at the metal detector
- Add extra insurance coverage
- Watch for scams where a group of thieves distracts you and then grabs your laptop

Sun scales up via Cray

By Craig Stedman

Sun Microsystems, Inc. continues to scale up both its server line and its campaign to make commercial shops feel warmer about its enterprise computing capabilities.

Sun, which is scrambling to shed its workstation-oriented image, is expected during the second half of the year to introduce a server that can handle up to 64 of its 64-bit UltraSPARC processors. The new system is being developed by Cray Research, Inc.'s SPARC-based server unit, which Sun agreed to buy last month.

The 64-processor machine is a follow-on to a 32-bit Cray box and will remain separate from Sun's own Ultra Enterprise line, a 30-CPU fam-

Sun, *page 41*

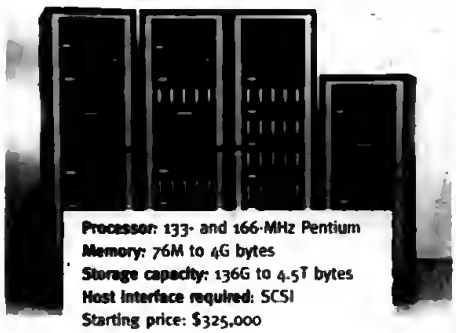
All in the family

A comparison of Sun's Ultra Enterprise 6000 server and the CS6400 server Sun is buying from Cray Research

PC providers have faith in NT, 41

Servers PCs

Storage Computer's Storage SuperServer



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	Ultra Enterprise 6000	CS6400
Processor	UltraSPARC	SuperSPARC II
Minimum memory	64M bytes	256M bytes
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Christopher Dallas-Feeney, Booz-Allen & Hamilton
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Introduction

Data Warehouses: Why Now?

The move to client/server represents a major shift in the development and delivery of applications. Considering the sizable investments organizations have in their existing systems, it is necessary that this shift happen in stages.

This is why incremental strategies, such as data warehousing, that preserve existing investments are so attractive to organizations. By moving data from existing production databases and applications to a data warehouse, organizations give their internal users direct, PC client access to corporate data.

A data warehouse takes time-oriented data from multiple applications and organizes it according to subjects meaningful to the corporation or business, which is driven by the need to inform its decision makers. IS is adopting the strategy of moving operational data from data sources optimized for transaction processing to a relational database tailored for decision support. There are two reasons for doing this: 1) The data in the decision support database or warehouse is made available to business users in a form that is easier for them to understand; and 2) The warehouse can be tuned to provide better performance and response time to meet the demands of complex queries and analysis.

Implementing a data warehouse is not a new concept. Since the 1980s, IS has recognized the benefits of separating data capture from data access. So why is data warehousing technology taking off at this point in time?

The reason is simple. Today, the maturation of data warehouse technology (which includes relational databases with bit-mapped indexing; specialized multi-dimensional databases; data transformation tools; and graphical data access and analysis tools) is coinciding with the rising need of many businesses to analyze customer-related information.

INSIDE:

Ultimately, it's a Systems Integration Challenge
Tools for Data Access are Evolving Rapidly
Turning Point for a Booming Market
Vertical Warehouses: Will They Stand up as Packaged Solutions?
The ROI Tells a Compelling Story

This White Paper was prepared under the direction of Henry Morris, Research Manager, Applications and Information Access at International Data Corp. Mr. Morris has written numerous white papers on software topics, and is frequently quoted on trends in client/server applications and information access. IDC, based in Framingham, Mass., is the IT industry's leading provider of market research and consulting services.

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Ultimately, it's a Systems Integration Challenge

By Henry Morris
Research Manager, Applications and Information Access, IDC

Even as it improves information access for corporate end users, the data warehousing process at the same time introduces new complexity to IS. Because multiple components of the data warehouse infrastructure must be linked together, a successful implementation is basically a systems integration challenge.

• Data from one or more production applications must be mapped to a unified model designed for the data warehouse. Data transformation tools can be used to generate data translation programs, which automate the generation of data into the warehouse. Some vendors of packaged applications are beginning to supply such tools with their applications.

• After the initial load or extraction of data to the warehouse, the ongoing synchronization between operational and decision support data can be enabled through new technologies such as data replication.

• Data access tools and/or decision support applications must be mapped to the warehouse. If an organization requires multi-dimensional analysis, the data must be moved to a multi-dimensional database.

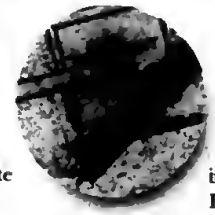
The information flow from transactional systems to the decision support environment is illustrated in IDC's application ecosystem model (Fig. 1). The lower half of the diagram represents software areas that support the process of data warehousing. The links shown can be built by IS alone, but not without considerable effort — even with state-of-the-art tools. As a result, many companies are looking to VARs or integrators, especially those with domain expertise in the information access requirements of a particular industry.

At one level, this picture represents a systems architecture view, showing the linkages that IS must create. But it can also be viewed as depicting the potential relationships among vendors or suppliers of technology. The application ecosystem is a graphical way of depicting the natural alliances formed by providers of the applications, databases and development tools, as well as the software glue that links these areas together. The scope of the technology encompassed in this model is so broad that no one vendor can offer a complete solution.

IDC sees vendors forming alliances to integrate technology in order to package related sectors of this model as integrated platforms. For example:

• Coda Inc. is extending its enterprise accounting application by linking and repackaging end-user data access tools from Cognos Inc.

• Walker Interactive is extending its enterprise accounting application by bundling Arbor Software's multi-dimensional database and data access middleware from Information Builders Inc.



• Both Prism Solutions Inc. and Evolutionary Technologies Inc. (ETI) are extending their data transformation tools to generate programs that can move data from SAP America's R/3 application suite to the data warehouse.

As vendors take more responsibility for integrating related technologies in and around the data warehouse, IS will benefit through reduced complexity. The results: Organizations that purchase technology get added value, while those who supply the technology get new channels of distribution.

Data warehousing issues

The application ecosystem model illustrates several issues related to the adoption of data warehousing technology:

End-user data access: Data warehouses serve the needs of end users for information. The ecosystem model shows several paths for users to get at corporate data. One path organizations can take is to direct them to production databases. However, the data warehouse provides added value. For instance, a data warehouse can be augmented with a separate multi-dimensional database or an OLAP (on-line analytical processing) server to re-organize information for data analysis. To what extent have organizations adopted OLAP server technology? At what rate is this use increasing? What tools are most popular with users for accessing data from their PCs?

Market size and growth: The ecosystem model shows that data warehousing today is a bringing together of many software technologies to help businesses improve information access. The data warehouse software market can be identified as the sum total of the underlying software markets. How large is this overall market? How fast is it growing?

The vertical warehouse: The ecosystem model is generic; it can be applied across industries. But which industries place the highest priority on data warehousing? Can a vertical view of the ecosystem model be packaged to address a particular industry's information access needs?

Return on investment: The ecosystem model illustrates the complex integration inherent in data warehousing. Complexity for IS often means long implementation cycles, which lead to higher costs. At organizations that have implemented data warehouses, do the benefits outweigh the costs? What are the results of IDC's ROI analysis of 62 data warehousing sites?

In the following sections, IDC analysts will explore these issues by examining the phenomenon from the perspectives of users, IS and data warehouse managers. These analysts draw on IDC surveys of user organizations and technology suppliers, particularly the following IDC research initiatives:

IDC's Strategic Software Investment Survey: To measure trends in user demand for software, in 1995 IDC surveyed 835 IS sites, asking IS managers in a range of industries about end-user data access and data warehouse priorities. Sites (i.e., single contiguous locations) ranged up to 35,000 employees, with a median of 150. Enterprises, comprising multiple sites, ranged up to 300,000 employees and averaged 580. Data presented in this White Paper on trends in end-user data access and data warehousing priorities by vertical industry is based on this survey.

Markets and Trends Vendor Surveys: To measure growth in software markets, IDC maintains a database of worldwide market statistics from more than 500 vendors based on annual input from leading technology suppliers. The information dates back to 1984 and includes market projections by IDC analysts through the year 1999. This database is the source of supply-side information for IDC's markets and trends reports on the major software areas. This White Paper uses this information to report the size and growth of the data warehouse software market.

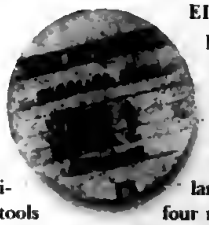
Data Warehousing Return on Investment Study: IDC's ROI study, sponsored by 20 leading IT suppliers, analyzes the impact of data warehousing. Interviews were conducted with 62 organizations that had implemented data warehouses, in order to measure the costs and benefits of this technology initiative. The ROI section of this White Paper includes summary findings from these case studies. ■

Henry Morris is research manager, applications and information access, at International Data Corp. His complete bio appears at the end of the section of this White Paper entitled Vertical Warehouses: Can They Stand up as Packaged Solutions?

Tools for Data Access Evolving Rapidly

By Michael Joseph
Research Analyst, Applications and Information Access, IDC

Data warehousing is a response to the demands of users, such as senior finance, business analysts and field sales staff, to access and analyze enterprise data to make decisions. As more users are granted direct access to corporate data, the appeal for data warehousing grows — to reduce complexity for the users and to speed up database query and analysis.



To what extent have organizations responded to demand from users? What tools do users currently prefer to access corporate data? How are these preferences changing? Vendors are promoting OLAP as a solution to the problem of business data analysis. How far are organizations going to adopt specialized OLAP tools and multi-dimensional databases? What will the growth of this market be?

In its Strategic Software Investment Survey of 835 U.S. IS managers, IDC found that:

- 57% of the sites currently have end users with ad hoc access to corporate data.
- Sites providing end-user data access expect a 32% growth rate in the number of users with data access by year-end.
- Among sites not providing access, 55% report end-user demand for data access.

Preferences in information access tools

Which tools can help end users access data? Which are growing fastest? IDC divides information access tools into five categories:

- spreadsheets (e.g., Microsoft Excel)
- personal databases (e.g., Lotus Approach)
- query and reporting tools (e.g., Business Objects)
- EIS/DSS drill-down/navigation tools (e.g., Cognos PowerPlay)
- multi-dimensional analysis/OLAP servers (e.g., Arbor Essbase)

To measure the relative popularity of each type of tool, IDC asked sites providing end user data access about tools now in use and their projections for year-end. The results are shown in Figure 2.

Spreadsheets are the most popular type of tool for data access but are growing the slowest. EIS, OLAP and graphical query and reporting tools — at 65%, 56% and 42% growth, respectively — will grow the fastest by year-end.

Low rate of growth for spreadsheets

Why are spreadsheets the most popular way to access corporate data? There are four main reasons: 1) availability — they are included in office software suites, usually packaged with a word processor and presentation software; 2) price — they are sold at a steep discount, making them pervasive on corporate desktops; 3) technological advances — spreadsheets include middleware to connect to data sources and advanced analysis features, such as pivot tables; 4) user skills — most users already know how to use spreadsheets and are comfortable with them.

But the rate growth of spreadsheets is low because more specialized information access tools are superior in two areas: end-user features and administration/management functionality. End-user features include:

- A business view of data (called a semantic or meta layer), which maps database column names and joins into business terms, and shields users from SQL.
- Graphical reporting capabilities, which provide intuitive ways to lay out reports.
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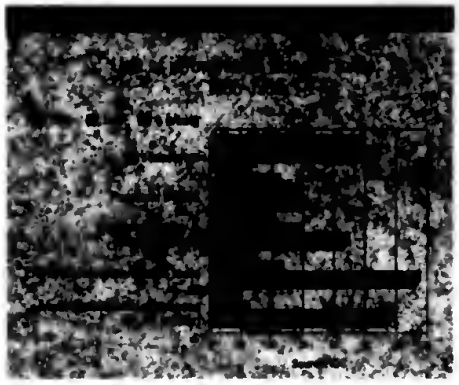
Administration and management functions include:

- The ability to scale up from small workgroups to enterprisewide deployment.
- Security and auditing to ensure data integrity.
- Query governance, which protects against runaway queries and maintain performance.

The popularity of spreadsheets, combined with the need to support additional functions, are driving the creation of hybrid solutions. Specialized information access tools use spreadsheets as a front end, or offer a spreadsheet option in addition to their own client software, because for many users it is a preferred interface.

Appreciating multi-dimensional databases

Although multidimensional databases have been around since the 1980s, only recently have they received a lot of media attention. Only 7% of users at respondent sites with end user data access currently use them. But they show a 56% growth rate in users who will have access by year-end.



OLAP servers are specialized datastores that hold aggregated and calculated data based on data from other databases. They typically function as a type of cache for a data warehouse or as a specialized application server for sales and marketing analysis, budgeting and forecasting.

A relational database allows views in two dimensions (sales by region). A multidimensional view of data lets users look at data at multiple dimensions (sales by region by quarter). To get this type of information requires either a specialized multidimensional database (sometimes known as OLAP) or a tool that takes multidimensional views of relational data (aka ROLAP). Factors in selecting one or the other include volatility of data, the size of data being accessed, and the response speed needed by users.

The functionality of the five categories of information access tools is converging. Spreadsheets are beginning to offer rudimentary pivot tables. Makers of graphical query tools are adding drill-down capabilities. Vendors of reporting tools are adding OLAP (or ROLAP) to their systems. OLAP server makers are partnering with front-end tool makers.

Directions in information access

New architectures for delivering information to users are emerging. Vendors of information access tools are enhancing their products to access data over the Internet and corporate Intranets. The economics of this mode of information distribution are compelling. Using standard Web browsers and an Internet connection, IS can roll out a distributed information access application to users anywhere in the organization without adding network bandwidth or installing specialized client software.

New types of information access tools are also appearing. For example, with data mining tools, users can answer these questions: What can I find out about my data that I don't already know? What questions can I ask of my data that I don't know how to ask? Market basket analysis (Which products are people most likely to purchase together?), promotions analysis, and exceptions detection are particularly suited to data mining.

New tools in the areas of data mining and data visualization, and new delivery mechanisms for information, such as corporate Intranets, will have a big impact on the market for information access tools. ■

Michael Joseph is a research analyst in IDC's Applications and Information Access program. He covers the market for end-user data access, analysis and reporting tools. His work includes sizing and forecasting demand, and assessing vendor positioning and competition in such areas as executive information systems, OLAP or multi-dimensional analysis systems, end-user query and reporting, spreadsheets, and statistics and technical data analysis.

Prudential Securities
Jamie Kiggen

By acquiring Illustra, Informix is taking the lead among the database companies in addressing the huge market for software that helps manage unstructured information.

Lehman Brothers Inc.
John Faig

We believe that the merger enhances Informix's long-term position. Informix has gained a 1-2 year lead over Oracle and Sybase and will begin to establish "mindshare" as the "next-generation RDBMS" company.

Furman Selz
Terence M. Quinn

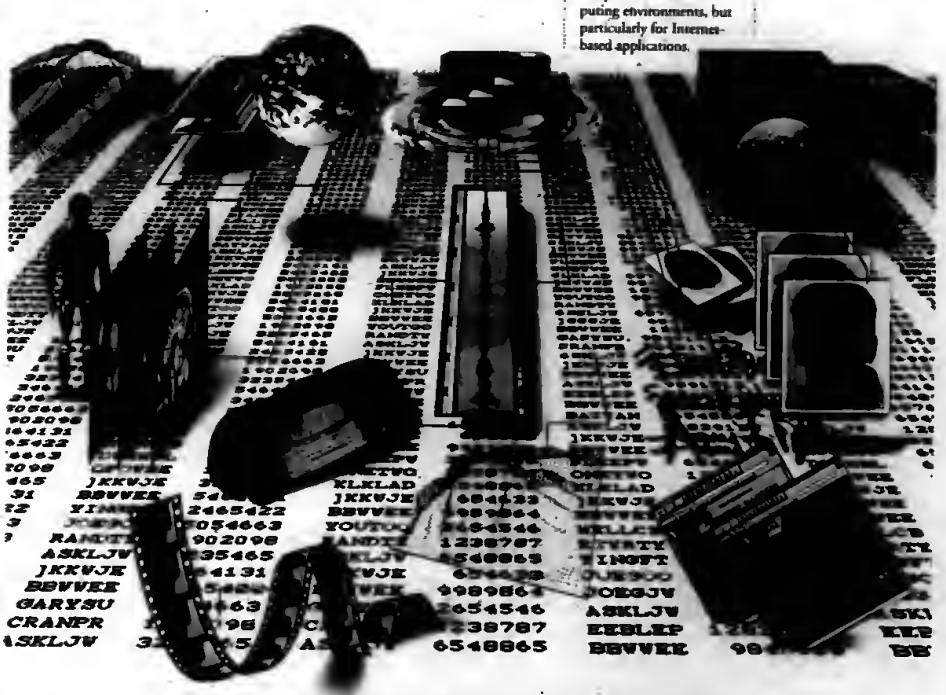
This is a highly strategic acquisition that appears to now place Informix in the lead ahead of Oracle in supplying database technology to the Internet.

Alex Brown & Sons Inc.
Bill Shattuck

This acquisition positions Informix to take and hold a strong leadership position in the emerging market for advanced DBMS for managing new types of digital information and complex data structures—which has broad applicability in traditional computing environments, but particularly for Internet-based applications.

Morgan Stanley & Co.
Charles Phillips

Informix has made a bet on the Web and multimedia based applications that could redefine the company's role in the industry.



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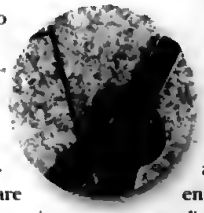
Booming Market Hits a Turning Point

By Stephen Hendrick
Program Director, Application Development Tools, IDC

The opportunities associated with the data warehousing market are enormous. Given the 90% average annual growth in demand for storage, the dramatic increase in the price/performance ratio of hardware, and the continuing delivery by vendors of operating environments and software tailored more specifically to data warehousing needs, the outlook for the technology has never been better.



Despite this optimistic outlook, there are challenges — some on the horizon, and some here right now. There are several persistent problems that are threatening to slow the rate at which businesses are adopting data warehouses. These problems include technological issues such as dynamic schema management, metadata-driven processing, support for temporal data, hardware and software scalability, more sophisticated exploratory data analysis, and automated operations.

But to the extent that problems represent opportunities, vendors sense the vast potential that exists in this market as users begin to search out formal ways to leverage their information asset.

Methodology of measuring the market

Although the data warehouse market today consists of hardware, software and service components, this White Paper will restrict the definition of the market to just packaged software components. From a software perspective, the data warehousing market encompasses three segments: the generation, management and utilization of information.

- The "generation market" includes tools for designing and populating the data warehouse. These input tools establish the data and process models for constructing a warehouse; extract data from operational databases; perform data cleansing/scrubbing; transform this data into a form suitable for management by a data warehouse; and input this data into the warehouse.
- The "data management market" encompasses the multi-user database engines necessary to store and manage the data warehouse data.
- The "data access market" includes tools designed to provide knowledge workers and end users with access to the data contained in the warehouse. This market includes specialized OLAP servers designed to provide multi-dimensional analysis; dedicated DSS and EIS builders; end-user query and reporting tools; and spending on 4GL and AI/expert system technology for use in developing data warehouse applications, production reporting and data mining.

IDC has sized the data warehouse market by allocating revenues on a vendor-by-vendor basis from established functional markets. Forecasts for the data warehouse marketplace are based on four parameters: historical vendor revenues, overall vendor growth by market, the stated strategic direction of the leading vendors in the data warehouse market, and an estimated technology adoption curve.

Market size and forecast

The overall forecast for the data warehouse market by vendor class is shown in Figure 3. According to IDC estimates, the data warehouse market in 1995 was $1,461 million. Independent software vendors (ISVs) in the United States have a 57.4% share of this market, with revenues of $839 million. The success of these ISVs is largely due to their leadership in the areas of data management (relational database engines), most of the markets for information access tools, and virtually all of the warehouse

generation market segment.

ISVs that can be considered leaders in their market segments include:

- in the area of warehouse generation: Evolutionary Technologies Inc. (ETI), Platinum Technology and Prism Solutions;
- in the area of warehouse management: Informix Software, Oracle, Red Brick and Sybase;
- and in the area of warehouse data access: Business Objects, Cognos Inc., SAS Institute, Oracle/IRI and Arbor Software.

U.S.-based systems vendors currently account for a 22% share of the data warehouse market, with combined revenues of $321 million. IBM, Hewlett-Packard, NCR and Tandem Computers are just four of the many companies that have implemented data warehouse technology programs and marketing programs through third party vendors to increase sales opportunities for their hardware.

International ISVs and systems vendors now drive just over 20% of data warehousing revenues, with shares of 16.7% and 3.9% respectively.

IDC forecasts the overall data warehouse market to grow to $5,632 million by the year 2000, a 31% average annual growth. But not every segment of the data warehousing marketplace will share in this growth equally.

IDC's outlook is that the warehouse generation and data management segments will enjoy high levels of growth, while the data access segment experiences only moderate growth. The higher growth rates for the warehouse generation and data management segments are testimony to the pent-up demand for warehouse products, combined with the relatively short time that reasonably complete warehouse solutions have been available.

There are several persistent problems that threaten to slow the rate at which businesses are adopting data warehouses.

The primary reason that the data access segment will experience only moderate growth is due to the

general maturity of this segment. However, niche markets in the data access segment, such as data mining and multi-dimensional analysis, will see extremely high growth over the next several years.

At a crucial point

It could be said that the data warehouse market is bidding its childhood farewell and entering its adolescenre. This will be an important point in the market's development. Although enough technology and product now exist to address each of the key market segments and activities, the ability of these tools to mature quickly will be the real key in moving the market beyond the early adopters and into the early majority.

To be widely adopted, these tools must be able to simplify, automate and integrate the "process" of implementing a data warehouse. That most vendors selling warehouse tools also realize higher than normal service revenues is an indication that the tools available today need more seasoning and development. IDC expects tools that embody higher levels of simplification, automation, and integration to be available by the end of the decade. ■

Stephen D. Hendrick is director of application development tools for International Data Corp. He manages IDC's Application Development Tools and System Level Software service, which includes databases, 4GLs, CASE products and data center software. He is responsible for advising on both market and technology directions, as well as forecasting industry segment size and the market shares of leading vendors.

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Vertical Warehouses:
Will They Stand Up as Packaged Solutions?

By Henry Morris
Research Manager, Applications and Information Access, IDC

The vertical warehouse is an integrated business solution provided by ISVs and VARs that concentrate on a particular vertical industry segment and are familiar with the data access requirements unique to that segment.

Vertical warehouses package related software and consulting services tailored to the information access needs of one vertical industry. As experience with data warehouse implementations grows and enabling technology matures, vertical warehouses will become increasingly viable. Solutions are likely to emerge first for industries that place the highest priority on investments to improve end user information access.

Warehouses are beginning to appear for specific verticals where there is a high interest in data warehousing. These packages can be offered at moderate price points and reduced implementation cycles.

Priorities by industry

Every industry has different priorities for investing in end-user data access. In IDC's Strategic Investment Study, respondents were asked to rate the priority (on a scale of 1-41) for their DBMS to support centralizing information in a data warehouse. The mean for all industries was 27.0, and two industries — finance and healthcare — were above that mean, with scores of 30.2 and 28.8 respectively. These scores were also the highest of the major segments represented in the survey. (See Figure 4.)

A production database is usually able to handle simple queries. However, complex queries running against a production database frequently present problems in terms of performance. When complex queries must be supported, organizations have a greater incentive to offload production data to a data warehouse optimized for this particular type of data access.

When respondents were asked about the relative priority for their DBMS to support complex query and application processing, the leading vertical segment was retail/wholesale (32.3).

Packaging the vertical warehouse

Is it possible to package a solution for decision support that includes a data warehouse?

A solution that has the ability to meet any information access or analysis need cannot be packaged, because these needs vary so much from one organization to another. But many business questions require data analysis within an industry, such as retail or healthcare, or in a cross-industry information domain, such as accounting.

Given an information domain-specific focus for a data warehouse, an ISV or VAR can bring together a package of related software products and services consisting of:

- An industry-specific data model
- Transformation tools and programs written to map popular data sources to the warehouse model
- Decision support applications and templates
- Value-added consulting to customize the data model, data transforms and decision support applications

Such a packaged approach to data warehousing should appeal to mid-sized organizations who cannot afford the time and expense of a fully custom implementation. The lower half of Figure 5 illustrates the scope of a vertical warehouse — packaging

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the links across the data access components of the application ecosystem. Retail, financial services and healthcare are industries where vertical warehouse solutions are appearing on the market, at price points in the hundreds of thousands rather than millions of dollars.

Addressing industry-specific business issues

Vertical warehouses can focus on the most critical business issues of a particular industry. When an industry is in the throes of rapid change, created by competitive pressures, the need for more powerful access to information increases. This trend applies to industries that put a high priority on data warehousing or that have complex data analysis needs. Here are some examples:

Banking: Companies in the major segments of the financial services industry (banking, insurance, brokerage) are competing for the same customers with overlapping products. Identifying trends in customer accounts and finding the best targets for new products are priorities.

Vertical warehouses for banking can meet this need. One example is the InformEnt data warehouse package from Fiserv. This solution is targeted at second-tier banks with assets ranging from $1 billion to $20 billion. Fiserv, an ISV and service provider, brings together technology from Oracle for the actual warehouse, Arbor Software for the multi-dimensional database, and ReportSmith (owned by Borland) for end-user data access — including base models and report templates developed for banking.

Retail: For retailers, dramatic changes in consumer buying patterns have created a crisis situation. The trend for consumers to buy directly from suppliers — through catalogs, home shopping networks or the Internet — increasingly cuts out the unfortunate retailer.

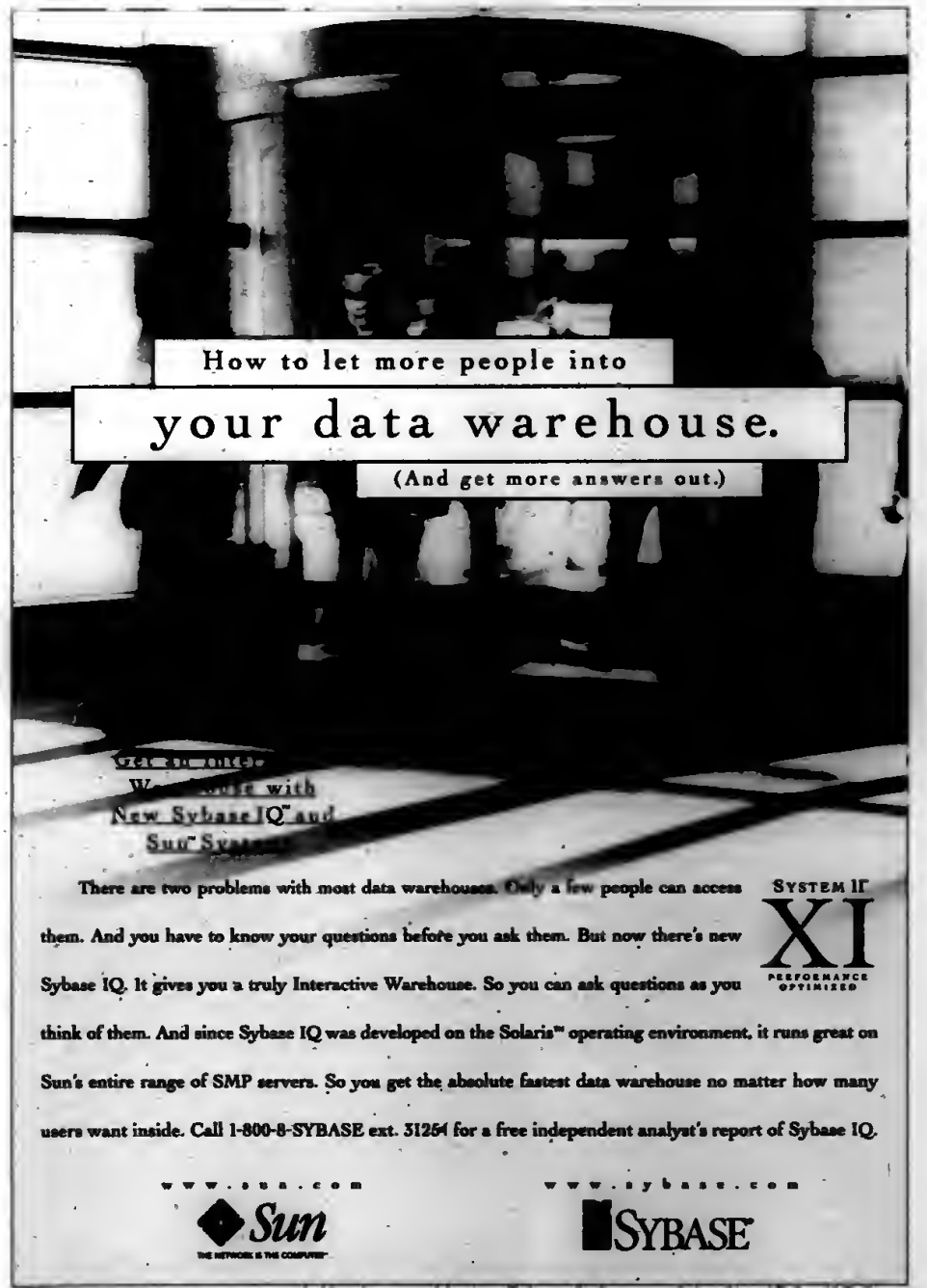
As a result, it is now more important than ever for retailers to understand their customers, in order to more finely target marketing strategies, such as direct mail promotions, aimed at ever narrower customer segments. Retailers have already made significant investments in their point-of-sale and order tracking systems that collect valuable data. Now, managing and leveraging their databases of customer information is emerging as a competitive differentiator.

To fill this need, vertical warehouses for retail are appearing from system vendors such as NCR (whose RightStart program is aimed at mid-sized organizations) and VARs such as CFT Consulting and STS Systems (members of Data General's vertically focused data warehouse program).

Healthcare: In the healthcare industry, institutions are under increasing pressure to manage risks and reduce costs. When an institution receives a fixed fee per person per year (capitation) rather than a fee for each service, patient health needs must be satisfied under strict cost controls. Here, point-of-care, rather than point-of-sale, data is being brought together for analysis.

IDC research shows that computerized patient records (integrating point-of-care information for a patient over time) is a focus of new investment for 56% of healthcare sites, ahead of all other healthcare application areas surveyed. Merging this clinical information with financial data in the data warehouse is a future direction.

Vertical warehouse solutions are currently being constructed that include links from popular healthcare application packages, transforming operational data to a warehouse built on a healthcare-specific data model. Sources of healthcare data warehouse solutions will include ISVs (such as Shared Medical Systems), specialized consulting organizations (such as Systems Techniques and Criterion Health Strategies), and information VARs (such as IMS American and MedStat).



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Summary

Vertical warehouses are beginning to appear for specific verticals where there is a high interest in data warehousing. These packages can be offered at moderate price points and reduced implementation cycles. This pricing and packaging should bring the technology for more powerful data analysis within the reach of mid-sized organizations who lack the resources for custom development.

Henry Morris is research manager for applications and information access at IDC. In this position, he focuses on the technology choices made by application vendors in such areas as object-oriented development, client/server architectures and support for data warehousing. He also analyzes the emerging partnerships that are being formed between application vendors and vendors in complementary software segments. He is also responsible for forecasting the size and shares of leading application vendors in selected vertical industries such as healthcare, banking and insurance.

Mr. Morris has taught technical writing at Northeastern University and Bentley College. He earned his BA from the University of Michigan and his Ph.D. from the University of Pennsylvania. He can be reached on the Internet at hmorris@idc.research.com ■

Some of the information in this White Paper stems from research conducted by IDC in the area of data warehousing. This research takes the form of one full-length report and eight research bulletins, covering areas such as software, hardware, vendor positioning, user strategies, market size, forecasts, and technology trends.

Other key points discussed in the series are the positioning of OLAP and MPP technologies; database scalability; and the benefits of a decentralized warehouse.

The research report is entitled Suppliers to the Vision: Data Warehousing Vendor Profiles. It covers leading hardware, software, storage and professional system vendors. The eight bulletins are:

- **Data Warehousing as an Application Strategy**
- **The Data Warehouse Market: Size and Forecast**
- **The Warehouse Explained**
- **The Evolution of the Data Warehouse**
- **The Vertical Warehouse**
- **Scalability and the Data Warehouse**
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For more information on any of these reports, please contact Cheryl Toffel at IDC at (508) 935-4389; fax (508) 935-4789; or on the Internet at ctoffel@idcresearch.com

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The ROI Tells a Compelling Story

By Stephen Graham
VP, Software Research, IDC Canada

For years, technology advocates have promised white collar workers easy access to the full range of organizational information they need to make sound business decisions. Too often, these promises have fallen short, leaving users with information that was often incomplete, frequently difficult to understand and sometimes even totally inaccurate.

With over $464 billion spent on technology in 1994 alone, IT's ability to meet the expectations of decision makers is now being called into question. Past experiences, often unfavorable, have led senior management to demand proof that a technology will not only deliver on its promises but add to the organization's bottom line.

However revolutionary data warehouses have been in the area of decision support, there is still one burning issue: Do they actually have an impact on an organization's bottom line?

In the few short years since its introduction, data warehousing has filled the void for a technology that could meet the need of decision makers to be provided with organizational information. Inside organizations, it has gained a great deal of support as a staging area to support many forms of decision support activities.

Bottom line results

However revolutionary data warehouses have been in the area of decisioo support, there is still one burning issue: Do they actually have an impact on an organization's bottom line? Many organizations, fearing that data warehousing will simply be another buzzword, require hard evidence for the technology to demonstrate its benefits.

Investing in technology is just one of the choices available to help organizations meet their objectives. Management needs a systematic way of selecting the optimum solutions. A ROI analysis is a good starting point for this decision-making process. Together with factors such as risk, competitive issues, timing and feasibility, a ROI analysis can lead to more profitable decisions regarding the use of technology.

A recent study conducted by IDC provides evidence of the benefits of conducting an ROI analysis. The study, entitled The Financial Impact of Data Warehousing, gathered information from 62 organizations that had implemented data warehousing.

The results of the study are an astounding testimonial to the efficacy of data warehouses. Data warehousing generated an average three-year ROI of 401%. Over 90% of the organizations included in the analysis reported ROI returns over 40%. Half of them reported returns greater than 160%, and 25% of them showed returns greater than 600%.

The average payback for the warehouse application was 2.3 years on costs averaging $2.2 million. The median payback was 1.67 years, the median ROI 167%.

The stories behind these numbers are just as compelling. A common thread binding the companies was their use of the information from the data warehouse to build a foundation of knowledge — knowledge that could arm decisinn makers with the data they need to make an optimum impact on the organization's bottom line.

After conducting many cost-benefit cases, a general pattern emerged in the benefits category which

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supports the notion that the warehouse has a direct impact on the decisions made in an organization. The benefits were allocated among three categories: keepers, gatherers and users.

Keepers of the data include the technical staff, previously responsible for data extractions and system maintenance, who were supporting information processing in a less than ideal environment. The savings to such processes are obvious and measurable, since building the warehouse has a direct and immediate impact on the nature of their job. Most companies construct their case for cost justification using these benefits alone, and some obtain support for the project using only this justification.

Gatherers of the data include those responsible for obtaining data and creating reports for business users. In most companies, gatherers are information analysts, although in reality they spend very little of their time conducting proactive analysis. Without a structured information architecture like data warehousing, their primary task often becomes finding information and producing a reliable report.

Watching time go down the drain

The savings that result from this process are generally quite substantial. Many companies are appalled to discover just how much time is wasted locating information. Even worse, the time spent finding information is duplicated by many people across the company, and repeated again when the information is needed at a later date.

The savings in this area are found when the time spent by business analysts gathering information is reallocated to proactive data analysis. Many organizations underuse the talents of their business analysts. Data warehousing helps bring focus to their true expertise. In a similar vein, downsizings at many organizations means that fewer analysts are employed. Data warehousing ensures that the remaining analysts are not overwhelmed by the resulting increased workload. Examining the cost savings associated with the processes and tasks of information gatherers helps organizations move beyond the sometimes mediocre ROI savings found in the data keeping arena.

Users of the data include those employees responsible for making decisions in a particular line of business. Savings are realized in terms of time and efficiency, or can be linked to decisions that result in further savings for the organization. For example, timely information from the warehouse can help a line-of-business manager save three hours a week in preparing marketing reports.

The warehouse really begins to show its strength when the information is used to find further cost savings and efficiencies. For example, storing more accurate data could lead to a decision to eliminate a distribution facility.

Potential for big benefits

It is with this third group — the users of the data — that the potential exists to reap enormous financial benefits from a data warehouse. In the course of preparing the study on the financial impact of data warehouses, IDC researchers discovered that these groups accounted for a full 50% of the benefits. For most organizations, key decisions that could now be supported by data in the warehouse made the difference between pedestrian savings and achieving results that could truly be considered astronomical.

The only drawback in this equation is the nearly impossible task of predicting savings about a future decision. Nonetheless, the first two benefits categories alone — keepers and gatherers — provide enough reason for most organizations to justify pursuing a data warehouse. Senior management must look beyond the financial benefits awaiting their organizations and recognize the potential for the data warehouse to build a solid foundation of knowledge upon which strategic decisions can be made. ■

Stephen Graham is vice president of software research at IDC Canada Ltd. He is responsible for research on the Canadian software market and for managing various multiclient projects, such as IDC's Financial Impact of Data Warehousing study. Mr. Graham recently completed a research project on the vendor community, and is in the process of releasing other works on the topic. He holds an Honors BA from the University of Waterloo, as well as an MBA from Wilfrid Laurier University. He can be reached at sgraham@idcresearch.com.

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PC providers put their faith in NT desktops

By Bob Francis

For years, corporate PC buyers accused NT of meaning "not there." Now, after customers have accepted Microsoft Corp.'s Windows NT operating system on its servers, the 32-bit oriented operating system looks ready to make inroads this year on the desktop.

An array of corporate PC providers — IBM, Compaq Computer Corp., Dell Computer Corp., Hewlett-Packard Co. and Digital Equipment Corp. — are peddling their desktop machines with the thought that Windows NT will, indeed, be there.

Prices for base NT systems will start at about $3,000 — an attractive prospect indeed, observers said. "Intel has basically made the price difference between a high-end Pentium system and a low-end Pentium Pro less than $400," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz.

While Windows NT shipments reached 2.2 million units last year, Dataquest, a research group in San Jose, Calif., expects 8 million copies of the operating system to ship this year. The increase comes as Microsoft incorporates the Windows 95 interface into the next version of Windows NT, 4.0, expected to ship this summer. The new interface should make the heavy-duty operating system more user-friendly.

And that's grabbed the attention of corporate information systems managers who see the operating system as more stable and secure than Windows 3.1 or Windows 95. A recent meeting of the Rocky Mountain Windows NT User Group in Denver was packed with corporate users examining a beta version of Windows NT 4.0.

Price dip

At the same time, a drop in the price of PC components — in particular, memory and storage, which are key NT requirements — has slashed the price of a Windows NT-ready PC by several hundred dollars.

"We'll be taking a look at it for some of our users, though we still believe Windows 95 is a solid system for many users," said Erik Goldoff, an IS manager at the Centers for Disease Control in Atlanta.

In the next month, several PC vendors will provide new Windows NT workstations geared for Version 4.0 of the operating system.

The basic system will provide a minimum of 16M bytes of high-end RAM, including extended data output and error checking and correcting RAM; a 1G-byte disk drive; and a 180-MHz Pentium Pro chip with 256K cache.

Many of the systems will also accommodate an additional Pentium Pro processor for using the symmetrical multiprocessing capabilities of Windows NT.

The Pentium Pro processor, from Intel Corp., was designed for 32-bit processing that dovetails neatly with Windows NT 32-bit design. But because Microsoft didn't initially plan for Windows NT to be a desktop operating system, users may be lacking some features on their desktops.

For example, full Plug-and-Play support, which allows users to add peripherals easily, may not be available in Windows NT 4.0, according to Microsoft officials.

An example of a Windows NT desktop

Dell OptiPlex GXpro

Processor:	180-MHz Pentium Pro
RAM:	16M-byte extended data output
Hard drive:	1G byte
Monitor:	15 in.
Operating system:	Windows NT 3.51 preloaded
Other features:	Soundblaster card
Price:	$2,899

Notebooks

CONTINUED FROM PAGE 39

ployees add riders to their home policies.

"That way, they feel more responsibility for the item," Drake said. "Right now, many workers see the laptops as just another piece of office supplies, and they don't take special precautions."

Drake said it can cost $69 yearly to insure a $5,000 notebook.

Los Angeles Police Sgt. Kevin Coffey, who moonlights as a security consultant battling laptop theft, said many larger companies have instituted security checks at their buildings to inspect briefcases and bags for items such as laptops.

"But a determined thief can find their way around that," said Coffey, whose company, Corporate Travel Safety, Inc., is based in Canoga Park, Calif. "I've seen people send laptops in interoffice mail as well as FedEx them out of the building. Those security checks discourage the opportunistic thief."

Coffey said various products can protect users, including the following:

- An encryption program for data protection from RSA Data Security in Redwood City, Calif.
- Computrace, software from Absolute Software, Inc. in Vancouver, British Columbia, which uses caller identification to inform police if a computer is missing.

Sun scales up via Cray

CONTINUED FROM PAGE 39

ily that was announced in mid-April. However, both run the Solaris operating system, and Sun officials said advanced reliability and availability features that Cray has built in to its systems will eventually find their way into the Ultra Enterprise models.

That was welcome news to Terry Nelms, manager of systems integrity at LDDS Worldcom, Inc., a long-distance telephone company in Jackson, Miss.

LDDS Worldcom uses a dozen Sun servers, including eight in the network security department in which Nelms works. "We run pretty critical applications on the servers, and we can't afford downtime on them," he said.

The Ultra Enterprise systems, which LDDS is looking at now, promise better scalability than Sun's previous servers. They also provide enterprise-friendly items such as redundant power supplies and the ability to replace some components while the system is running. But Cray's more advanced capabilities would be "nice additions," Nelms said.

The Cray-developed features that Sun wants to use include the following:

- Support for partitioning the Solaris operating system into separate domains that run on different processors.
- More extensive "hot plug" support for changing processors, disks and other parts without turning off the system.
- A status monitor that lets off-site service technicians run diagnostics if the server crashes or components fail.
- More linear performance scaling as the CPU count grows.

Those all helped persuade the American Automobile Association (AAA) to buy a 20-processor version of Cray's 32-bit CS6400 system last year. The CS6400, which is based on Sun's earlier SuperSPARC chip, kept scaling comfortably while Sun's then top-of-the-line SPARCcenter 2000 hit the wall at eight CPUs, said Mike Seiler, Unix systems administrator at AAA in Heathrow, Fla.

Accessibility key

Cray's high-availability features also were important to AAA, which uses the CS6400 to provide online travel information and reservation capabilities to its local offices. "This is a mission-critical system here, and the only time I can take it down is at midnight on Saturdays for six hours," Seiler said.

Now more than 2 years old, the CS6400 trails the Ultra Enterprise line on things such as system bandwidth and memory capacity (see chart, page 39). But sources said the upcoming UltraSPARC-based version will be beefed up all around, including use of the same Gigaplane I/O bus that Sun put in the Ultra Enterprise boxes.

The new model will be given a different name that hasn't been finalized, said Carl Stolle, director of server marketing at Sun. He wouldn't say when pieces of Cray's technology will start showing up in the Ultra Enterprise machines.

CS6400 seen as better fit at Sun

The CS6400 and its upcoming UltraSPARC-based follow-on should fit more comfortably at Sun than they did at supercomputer maker Cray Research, users and analysts said.

The CS6400 got strong reviews after its late 1993 introduction, but sales failed to meet Cray's expectations, according to analysts.

International Data Corp. in Framingham, Mass., counted about 80 CS6400 shipments by the end of 1995, and it said more than half were bought by Cray partners in the technical market.

Commercial shops generally knew Cray only for its big number-crunchers.

"You tell somebody that you have a Cray, and they think you have a supercomputer," said Mike Seiler, Unix systems administrator at AAA, a CS6400 user in Heathrow, Fla. "They hear the name and start backing off."

Sun won't face the same blank stares, and Seiler said its planned purchase of the CS6400 unit should streamline customer service and operating system updates. "One of the things I've noticed is that when I make a service call, Cray quite often has to go Sun to get the answer," he said.

The CS6400 became even less of a fit for Cray earlier this year when the company agreed to a buyout offer from Sun rival Silicon Graphics, Inc. (SGI). The UltraSPARC-based system was supposed to ship this quarter, but it was put on hold while SGI tried to unload the server unit.

— Craig Stedman

Count on Power
Count on the p

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New Products

Micro Design International, Inc. has introduced a line of eight-drive, CD-ROM towers.

According to the Winter Park, Fla., company, the towers let users attach eight drives to a single target identification for up to 56 CD-ROMs on a single host adapter. The towers house six-speed or quad-speed drives with transfer rates up to 1,000K byte/sec.

The towers include Micro Design's SCSI Express software that gives users transparent access and device management in a variety of environments, including Novell, Inc.'s NetWare, IBM OS/2, Microsoft Corp.'s Windows NT and Apple Computer, Inc.'s Macintosh. Pricing starts at $4,095.

▶ *Micro Design International (407) 677-8333*

Panasonic Computer Peripheral Co. has introduced PD/CD-ROM Libraries, a line of multidisk, multidrive autochangers.

According to the Secaucus, N.J., company, PD/CD-ROM Libraries are multidisk storage and retrieval devices that allow access to CDs and rewritable PD disks from a single source.

They can be used to access a combination of rewritable, 650M-byte PD disks or CD-ROM titles at quad speed.

The 50-disk model employs up to two disk drives and stores up to 33.4G bytes of data. Pricing starts at $5,995.

▶ *Panasonic Computer Peripheral (201) 348-7000*

Product short

JetFax, Inc. has announced a 33.6K bit/sec. upgrade to JetFax M5, a multifunction fax machine/copier/printer. JetFax M5 operates as a laser-quality fax machine and printer, an office copier, a 300 dot/in. PC scanner and a PC fax modem. The modem upgrade costs $595. JetFax, Menlo Park, Calif. (415) 324-0600.

Briefs

More Lifeline capacity

Invincible Technologies Corp. (ITC), a Franklin, Mass., company that makes Network File System servers, increased the usable storage capacity of its Alpha-based Lifeline systems from 80G bytes to 270G bytes. ITC this summer plans to enable multiple Lifeline servers to store files on the same disks and to take over for one another when failures occur. The combined system could be managed as a single entity, officials said. Pricing starts at $38,000.

Notebooks: Dell cuts price of Latitude line ...

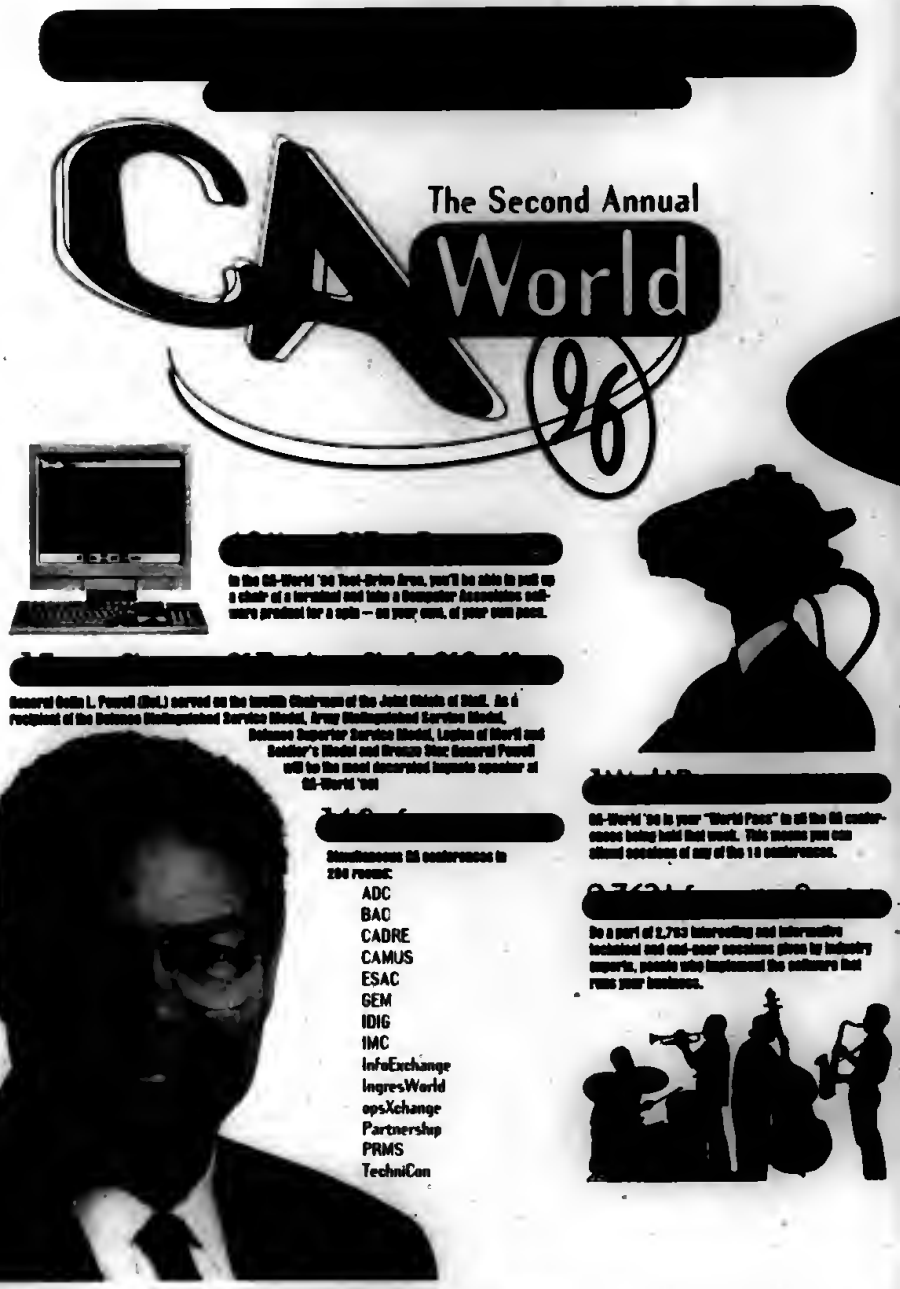
Dell Computer Corp. has cut the price of its Latitude notebook line by 8%, joining a large group of vendors that has been slashing prices since the beginning of the year. The Latitude XPi P90D, with a 90-MHz chip and up to 8M bytes of RAM, now costs $2,399, down from $2,599. The Latitude XPi P120D, with a 120-MHz chip and up to 8M bytes of RAM, was reduced by $300, to $2,599.

... and TI expands storage in TravelMate line

Texas Instruments, Inc. is expanding storage capacity in the TravelMate notebook line to 2.1G bytes and memory to 16M bytes standard, the highest capacities available in notebooks. The TravelMate 5373ST also will have a 133-MHz Pentium processor with Peripheral Component Interconnect bus architecture and an 11.3-in. screen. It will cost $5,499.

Unisys PCs bundled up

Unisys Corp.'s Aquanta line of business PCs will offer preloading of IBM's Software Server suite for OS/2 or Windows NT operating systems. The Software Server suite includes Notes groupware and IBM's DB2 database and SystemView management software.



American Power Conversion Corp. has introduced SurgeArrest Notebook, a surge protector for computer notebook users.

According to the West Kingston, R.I., company, SurgeArrest Notebook is a travel-size protector that gives users high-performance telephone protection and one-outlet AC protection to prevent against power surges and spikes.

It has two modem/fax lines, a thermal fuse that will disconnect the AC line in the event of sustained overvoltage, three telephone jacks and a six-foot detachable cord.

SurgeArrest Notebook costs $30.

More information is available at American Power Conversion's home page at www.apcc.com.

▶ *American Power Conversion*
(401) 789-5735

Creative Technology Ltd. has introduced Phone Blaster 28.8 PnP, an all-in-one multimedia, telephone communications and Internet telephony card.

According to the Milpitas, Calif., company, the product is a central management system that consolidates electronic mail, voice mail and fax messages for remote retrieval.

It combines a 28.8K bit/sec. V.34 data/fax/voice modem with a full-duplex speaker phone. It includes computer telephony features, tools for full-duplex communications over the Internet, multiple user-configurable mailboxes and plug-and-play support for Microsoft Corp.'s Windows 95 and Windows 3.1.

Pricing for Phone Blaster 28.8 PnP starts at $269.

▶ *Creative Technology*
(408) 428-6600

Qualstar Corp. has announced the TLS-2000 series, six automated tape libraries for 4mm digital audio tape (DAT) technology.

According to the Canoga Park, Calif., company the TLS-2000 series libraries can store from 72G to 1.2T bytes.

Qualstar's TLS-2000 *series libraries were designed to simplify installation*

The libraries use unmodified DAT drives from Hewlett-Packard Co., Sony Corp. and Conner Peripherals, Inc.

The TLS-2000 series libraries were designed to simplify installation for users by eliminating all electrical and mechanical adjustments. This makes the units self-aligning.

All models include dual power supplies and filtered positive air pressure systems. Pricing will be announced in July.

▶ *Qualstar*
(818) 592-0061

Visual Business Systems, Inc. has announced Pizazz, a Macintosh-based software raster-image processor for wide-format ink-jet printers.

According to the Boxboro, Mass., company, Pizazz automates the production of graphic-art quality posters and signage from computer-generated images. It was designed to permit color corrections to the image processor files.

Pizazz costs $4,495.

More information is available at Visual Business Systems' home page at www.VisBusSys.com/VBS.

▶ *Visual Business Systems*
(508) 263-9900

StarDot Technologies has rolled out WinCam.One, a color digital desktop camera system.

According to the Brea, Calif., company, WinCam.One is a camera and imaging system that plugs in to a user's PC serial port and eliminates the need for video capture cards and camcorders.

It includes a tripod and a slide adapter for digitizing 35mm slides.

WinCam.One's camera aiming and focusing is done through a live on-screen view finder. A serial port connection lets users place the camera up to 250 feet away. A modem can be attached to WinCam.One to set up a remote security camera.

Pricing for WinCam.One starts at $269.

More information is available at StarDot's home page at www.wincam.com.

▶ *StarDot Technologies*
(714) 528-9719

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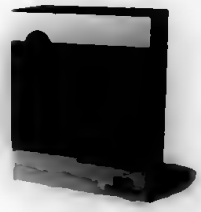

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Review

PowerBuilder 5.0 delivers application partitioning, 32-bit compiler, 50

Software

Java jolts new add-on tools arena

By Frank Hayes

Can Java replace PowerBuilder and Visual Basic?

Many corporate developers hope to use Sun Microsystems, Inc.'s Internet development language for mainstream cross-platform development.

"If somebody ripped out Visual Basic and stuck Java underneath, it would be perfect," said Steve Yalovitser, a Java consultant at Chemical Banking Corp. in New York.

That's not possible just yet, though. Like Visual Basic from Microsoft Corp. and PowerBuilder from Sybase, Inc.'s Powersoft subsidiary, the new Java development systems let programmers use a mouse to connect user-interface widgets, database access components and other elements to programs.

But unlike Visual Basic and PowerBuilder developers, Java programmers can't just go out and buy the prewritten modules

Java, page 50

R/3's sticky wicket

Recruiting — and keeping — talent for the SAP software is tricky

By Julia King
PITTSBURGH

As more companies go live with SAP AG's R/3 software, the number and variety of lessons learned during implementation continues to grow.

At Westinghouse Electric Corp., which cut over to SAP's R/3 financial applications in January, many of these lessons are nontechnical and have little to do with the software itself. Instead, managers said, the problems stem from underestimating the difficulty of recruiting key R/3 experts and the extent of their own users' reluctance to change.

"You have to leave extra time to find and get qualified SAP resources," said Don Janson, leader of the Pittsburgh-based company's finance re-engineering team.

Janson said managers also "grossly underestimated" the impact that a single integrated system would have on a company that has prized the autonomy of individual business units for more than three decades.

"The reason SAP is so difficult to implement at a company like Westinghouse is because it is so integrated," said Ruth Wepfer, also a member of the finance re-engineering team.

"If you make a change, you can have somebody down the hall stand up and scream that you just blew them out of the water. The difficulties are not software-specific. They're organizational," she added.

Westinghouse's Ruth Wepfer: *SAP is difficult to implement*

Westinghouse's Don Janson: *Leave time to get SAP resources*

The carrot

To keep necessary technical talent on board, Westinghouse devised a variety of financial incentives for information systems staffers and businesspeople working on the project.

For example, each October, IS staffers receive "hot skills pay." Janson conducts a survey of salaries on the open market and then increases staffers' salaries to match. So far, the company has lost only one IS staffer from the project since it began last September.

And all 100 or so Westinghouse staffers on the implementation team of about 120 are eligible to receive so-called milestone awards. These can range between $8,000

R/3, page 54

Waiting for Copland? Apple offers Harmony

By Lisa Picarille

Apple Computer, Inc. has changed its tune. Instead of delivering Copland, the next generation of its Mac OS, by the end of the year, the company will ask users to adopt Harmony, an interim version of its operating system that incorporates some of Copland's features.

Harmony adds support for the Internet, several Apple graphics technologies such as QuickDraw 3D, and some cosmetic user interface changes originally slated for Copland, according to Jim Gable, Apple's senior director for system software product marketing. Harmony is due by the end of the year, he added.

Previously, Apple said its System 7.5.3, which was released in March, would be the last update to the Mac OS before Copland was delivered. But the release of Copland, Apple's microkernel-based version of the Mac OS, has been pushed back until "mid-1997," Gable said.

Harmony was designed to keep the peace with Macintosh users who have been clamoring for Copland, which has been renamed Mac OS 8. Harmony will include support for QuickTime 2.5, QuickDraw 3D, OpenDoc and Cyberdog.

It also will incorporate other Mac OS 8 features, including the ability to navigate and manage files by using tabbed folders.

Users cheer

Users said they were pleased at Apple's decision to have an interim release before Copland.

"I'm glad I don't have to wait for Copland," said Mike Bailey, a systems analyst at Lockheed Martin Missiles and Space, an aerospace firm in Sunnyvale, Calif., that has more than 9,500 Macintoshes. "There are a lot of Copland features, like Internet support and OpenDoc, that I want to be using now — and if Apple has already finished them, why should I have to wait until next summer?"

Harmony will add new features, but users will be able to run their existing Macintosh software without modification.

And developers won't need to learn a new application programming interface.

That isn't the situation with Copland, for which developers will have to retool their existing applications to run.

Copland is microkernel-based. It will be compatible with the Common Hardware Reference Platform (CHRP) specification, developed by IBM and Apple to enable CHRP-compliant machines to run a variety of operating systems, including OS/2 and AIX, Windows NT, Sun Microsys-

Harmony, page 54

Mac OS matures

Version	System 7.5	System 7.5.2	Buster	Harmony	Copland (Mac OS 8)
Major features	QuickDraw GX, PowerTalk, AppleGuide	PCI support, PowerPC compatible	Bug fixes to stop Type 8 PowerBook crashes; improved performance on Duo 2300s and PowerBooks; PCI Macs emulator fix	QuickTime 2.5, QuickDraw 3D, OpenDoc, Cyberdog, tabbed folders	Microkernel architecture, improved finder search engine, customizable interface, compatible with Common Hardware Reference Platform

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Application Development

PowerBuilder upgrade delivers

Application partitioning, 32-bit compiler top new-features list

By Howard Millman

Powersoft's major upgrade to its flagship development system finally moves it into the rarefied realm of enterprise-class development environments and out of the confines of workgroup and departmental tool sets.

Having worked with a late beta release of PowerBuilder 5.0, I predict its enhancements will handily meet the needs of large-scale developers of client/server applications — including Internet access to popular relational databases.

Review

What's new

Notable features include application partitioning and s new 32-bit compiler. Previously, PowerBuilder used interpreted code. Version 5.0 uses Watcom's highly regarded C compiler to translate Powerscripts into P-code, then into C code and then route it to the Watcom compiler for final processing into machine code.

Watcom's compiled code executes noticeably faster than PowerBuilder's previous P-code interpreter, but you may want to continue using the interpreter for interim compiles.

Unfortunately, developers can't access the C code produced during the intermediate translation. That access would vastly expand the number of supported hardware platforms.

The inclusion of partitioning lets developers select which objects will reside remotely oo servers and which will reside on the client. Developers can use PowerBuilder's proprietary distributed object model or, with OLE automation, oon-native distribution models.

The Windows 95 and NT versions of PowerBuilder 5.0 include full OLE 2.0 support that lets PowerBuilder applications readily exchange data with other OLE-enabled applications. Windows 95 logo-compliance assures a common front-end appearance — including the tabs, lists and trees.

To help manage team development projects, PowerBuilder 5.0's ObjectCycle, a server-based object management facility, provides versioning controls. These include check-in, check-out and revision labelling.

Powersoft claims that its newly optimized Open Database Connectivity (ODBC) application programming interfaces and native database drivers will also improve performance. PowerBuilder 5.0 applications can use Powersoft's or third-party ODBC drivers to query desktop databases. Native drivers link to major relational database management systems or to the SQL Anywhere RDBMS from Powersoft parent Sybase, inc., which is included in the package.

Price: Desktop version, $295; Professional version, $1,295; Enterprise version, $2,995

At what price?

Powersoft achieved its gains in scalability without increasing PowerBuilder's complexity.

Using Windows NT 3.51 workstation and server running on two IBM PC 750 boxes, I built and compiled a front end to a Microsoft SQL Server 6.5 database. PowerBuilder 5.0's Painters, a series of design and build modules, made short work of creating the application's windows, menus and forms.

After creating the interface, Project Painter prepares the code files and sends them to the compiler. Following a successful compile, I launched Install Builder to automatically create a runtime SETUP.EXE file.

I found PowerBuilder's integrated development environment to be well-organized. It is fully object-oriented and supports encapsulation, polymorphism and inheritance. You can create your own objects or select them from the 1,500 objects in the package's Foundation Class Library. User-created objects can inherit any of the properties of the objects in a Foundation Class.

Objects can be readily located within a PowerBuilder library file with a library viewer.

Other professional features include the DataWindow Painter. This tool establishes the links to relational databases and serves as a control for Microsoft's internet Explorer or as a plug-in for Netscape's Navigator browser. You can save DataWindows to a Hypertext Markup Language file and provide seamless access and display capabilities to browser-based Internet applications.

My concerns about PowerBuilder 5.0's inability to access the products of intermediate translation and my preference to have PowerBuilder classes inherit C++ classes, or at least make instances of them, are minor.

PowerBuilder, especially when combined with other Powersoft products (SQL Anywhere, ObjectCycle and InfoMaker) will create a robust DBMS.

Client and server versions are available for Windows 95 and Windows NT. Client-only versions are available for Windows 3.1. Versions for Sun Microsystems, Inc.'s Solaris, Digital Equipment Corp.'s Alpha and Macintosh platforms are due later this year.

Java jolts add-on tool market

CONTINUED FROM PAGE 47

they need from third-party vendors.

"There's always a need for add-ons," said Doug Garrett, president of Another Net Software Co., a Java development firm in Fremont, Calif. "In Java's case, the most important classes are there, but some that you would like to have are still missing" from the basic Java libraries that come free from Sun, be said.

Those free libraries include basic support for building Java applications, including data handling and network communication. Sun plans to strengthen its Java libraries later this year.

In the wings

But in the meantime, other vendors are stepping up to fill the holes. Rogue Wave Software, Inc. in Corvallis, Ore., last week announced a Java version of its C++ libraries.

The Java version, which will ship in July, supports complex data-handling functions and access to databases from Oracle Corp. and Sybase.

Thought, Inc. in San Francisco is shipping a set of general-purpose data-handling libraries that support sorting and other functions, as well as specialized libraries for financial calculations and wild-card searches. (see chart).

Other vendors, including Powersoft and SourceCraft, Inc. in Burlington, Mass., are also adding libraries to their Java tool sets.

But Powersoft and SourceCraft don't plan to make those libraries available separately.

Some developers may buy those tool sets just for the libraries because development time and Java expertise are at s premium today.

"If you use just what comes with Java, it may take you perhaps a bit longer. It's s matter of how fast you'll be able to develop and deliver something," Garrett said.

Third-party Java class libraries

	Rogue Wave Software	Thought
Product	JDBTools, JTools	Netmag, Cinnamonay and Vanilla Search
Availability	July	Now

New Product

Integrated Computer Solutions, Inc. has announced Builder Xcessory 4.0, a graphical user interface (GUI) builder.

According to the Cambridge, Mass., firm, Builder Xcessory 4.0 lets users quickly build GUIs for Sun Microsystems, Inc. Java-based applications and applets.

Builder Xcessory 4.0 will be available in August on Sun's Solaris and Sun OS platforms, Silicon Graphics, inc.'s Irix, Hewlett-Packard Co.'s HP-UX, Digital Equipment Corp.'s Unix, IBM's AIX and SCO, Inc.'s OpenServer. Pricing will start at $3,200 per floating development seat. More information is available at the Integrated Computer Solutions home page at www.ics.com.

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SunSoft

Apple offers Harmony

CONTINUED FROM PAGE 47

tems, Inc.'s Solaris and the Mac OS.

But even with the new features, one analyst said Harmony will still be very familiar to users.

"It's mainly a cosmetic upgrade," said Pieter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif. "Kind of like Windows 95."

Gahle said Harmony is in line with Apple's plans to continuously release versions of Mac OS that are targeted at specific types of Macintosh users.

Under the new operating system release plan, outlined last month at the Apple Worldwide Developers Conference in San Jose, Calif., technical and power users will gain access to newly developed Apple technologies more quickly via interim releases. The bulk of general users can choose to wait and receive the new features all at once in a major systems software upgrade.

Microsoft Corp. used a similar tack when beta-testing new features for its Windows 95 operating system that was delivered last summer.

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EXIDE ELECTRONICS

R/3's sticky wicket

CONTINUED FROM PAGE 47

and $15,000 over the course of the implementation. The bonuses are tailored to keep people from leaving the team before the project is completed.

So far, Westinghouse has implemented R/3's asset management and financial applications at some 40 sites that comprise six divisions in North America. The company next year plans to roll out the R/3 payroll system to all Westinghouse units in North America, Europe and Asia.

Streamlined

Once fully deployed, Janson said R/3 will replace more than 125 separate financial systems that run on 27 different hardware platforms. R/3, by contrast, will run on a single platform — IBM's SP/2 Unix-based supercomputer — with Oracle Corp. databases and a mix of Windows 3.1 clients and Windows 95 clients. Companywide, the system will support 600 regular users and another 1,300 or so casual users.

But compared with legacy applications, the R/3 system requires that Westinghouse users input much more data than ever before. For example, under R/3, all 350,000 assets that the system manages must be tracked beyond the divisional level to individual cost centers in a division. But getting users to provide this information has been a challenge, Janson said.

"The resistance to change cost me implementation time," Janson said.

As a result, the company has decided against forcing yet more changes right away and has pushed back a planned 1996 installation of a new R/3 payroll system to 1997 or 1998.

"It was just too much change to handle," Janson said.

Briefs

Java pack rolls out

Art Technology Group, Inc. in Boston is shipping Dynamo 2, an Internet application engine based on Java, Sun Microsystems, Inc.'s Internet development language. Dynamo 2 links a programming environment, an object-oriented database and reusable components that support mail, session tracking and a Java-to-database interface. The system supports servers from Netscape Communications Corp. and, in June, from Microsoft Corp. Dynamo 2 costs $5,000.

Big iron meets the Web

Attachmate Corp. has announced its Enterprise Host Publishing System, an application development environment designed to give World Wide Web browsers access to mainframe data in a graphical user interface format. The system costs $35,000.

New Products

Extensis Corp. has introduced PhotoNavigator, an Adobe Systems, Inc. Photoshop enhancement.

According to the Portland, Ore., company, PhotoNavigator lets users quickly navigate their way around images. It creates a resizable palette within Photoshop that contains a thumbnail representation of an entire image. The palette lets users point, drag and click within the image without having to wait for the screen to redraw.

PhotoNavigator was designed to work with Photoshop 3.0.4 or later. It is available free through Extensis' home page at www.extensis.com.

▶ *Extensis*
(503) 274-2020

Advanced Software Development Corp. has introduced U.A. Corporate Accounting 4.0, a double-entry, Windows-based client/server accounting application.

According to the New Orleans company, U.A. Corporate Accounting 4.0 has modules for accounts receivable, accounts payable, general ledger, purchasing, inventory control, order-entry job costing and payroll. It includes Microsoft Corp.'s Jet 3.0 database-retrieval engine. It also includes features that let users create World Wide Web pages where visiting customers can place orders.

U.A. Corporate Accounting 4.0 features general-ledger departmentalization, recurring accounts receivable billing and accounts payable payments, and advanced security options.

Pricing for U.A. Corporate Accounting 4.0 starts at $495 for an entry-level system.

▶ *Advanced Software Development*
(504) 851-6600

Time Line Solutions Corp. has introduced Project Updater, a client/server, Windows 95-based project management tool.

According to the Novato, Calif., company, Project Updater creates an Oracle Corp.-based data warehouse for Time Line Solutions' Time Line and Microsoft Corp.'s Project. It lets project managers closely monitor a project's progress and lets team members update activities logs in a consistent manner.

Project Updater comes with Oracle Workgroup Server for Windows NT or Novell, Inc. NetWare. Project Updater Server is free when purchased with 10 client licenses, which cost $2,490.

▶ *Time Line Solutions*
(415) 898-1919

Logicraft Information Systems, Inc. has released FastCD Personal Edition, CD-ROM emulation software.

According to the Nashua, N.H., company, FastCD Personal Edition lets users run any Windows 95 or Windows NT CD-ROM application directly off a hard disk without a CD-ROM drive. It builds CD-ROM images by caching the entire contents of a CD-ROM in a single container file located on a local or network hard drive, appearing as "virtual CD-ROMs."

FastCD Personal Edition lets users run multiple CD-ROM applications at the same time off their local hard disks. In networked environments, it lets users access multiple CD-ROM applications simultaneously off shared images stored on any file server or off other PCs in peer-to-peer fashion.

FastCD Personal Edition costs $25. More information is available at Logicraft's home page at www.logocraft.com.

▶ *Logicraft Information Systems*
(603) 880-0300

Product shorts

MediaMagic Solutions, Inc. has released Instant Memos, software that lets users place electronic "sticky" notes on their desktops. Users can change note sizes and colors and set reminder alarms for specific dates and times. It requires Windows 3.1 or Windows 95, 350K bytes of RAM and 1M byte of hard disk space. Price: $20. MediaMagic Solutions, Cupertino, Calif., (408) 777-7676. ... **Delphus, Inc.** has announced WinX11, a Windows-based interface for business forecasting and trend analysis. It is an interface for X11Arima/88, the seasonal adjustment program used with census and other statistical compilations. Price: $1,995. Delphus, Morristown, N.J., (201) 267-9269.

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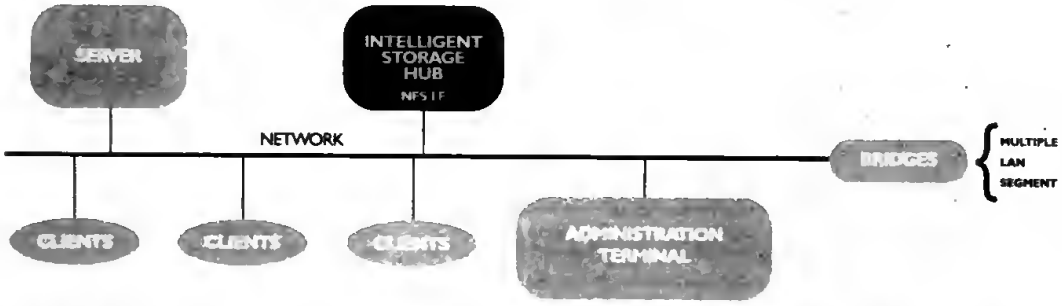

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Spectrum warehouse consolidates net data, 62

The Enterprise Network

Utility lines unleashed

By Bob Wallace

Now that regulatory restrictions have been removed, several large utilities are poised to offer telecommunications services to other users.

Utilities have historically had some of the largest and highest-capacity private networks nationwide.

But until recently, red tape discouraged them from competing with established local and long-distance carriers.

When President Clinton signed the Telecommunications Reform Act of 1996, he gave utilities the green light to compete with incumbents for information systems dollars.

That presents the utilities with some key challenges (see story, page 60), even as the companies prepare to provide alternatives for voice and data links and Internet access.

Entergy Services, Inc. in Gretna, La., heard opportunity knocking. It has created Entergy Technology Corp. (ETC), a unit that will sell capacity on Entergy Services' sprawling four-state network to users this year.

ETC plans to sell users T1 (1.544M bit/sec.) and T3 (45M bit/sec.) links on its network, which serves Louisiana, Arkansas, Mississippi and southeastern Texas, said Earl Perkins, manager of network planning services at Entergy Services.

Discussions are under way with other utilities, including those in Florida and South Carolina, to connect their networks for wider geographic reach.

Ownership has its privileges

ETC "will be most popular in geographic areas where current carriers don't have network links and where carriers have links [that] are already heavily used," Perkins said. "And a lot will have to do with how we price the T1s and T3s."

Companies such as Entergy can sell users excess network capacity because they own the land along their power lines.

These rights-of-way are used to install inexpensive, high-capacity fiber cable to form private networks. But reselling network capacity to users and Internet service providers isn't a simple proposition for all utilities.

Issues to consider

When deciding between a utility and a traditional carrier for WAN links, consider which one has:

- Links where they're needed
- The lower price
- Better service and support
- Required speed
- Ability to better reroute traffic if the primary line goes down
- Packaged equipment with the links
- The best service-level performance agreements
- The best network monitoring and management services

"We're in the investigative stages right now," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, Del.

"I'm making a wish list of what we'd need [for] people, equipment and money to make this a success. We need to get a good idea of what our total costs will be," he said.

Cost savings

There is a tremendous amount of organizational issues for such an endeavor, Scoggin said. "For example, we'd need to hire staff to be able to man our network operations center around the clock. Today, we don't have 24-by-7 coverage," he said.

Some utilities say other users can benefit even if carriers buy the extra capacity.

Carriers can save money by buying capacity from utilities because that is cheaper than building network additions to cover areas already served by user networks.

The carriers, in turn, can pass along the savings to their customers.

That is the plan for Northeast Utilities, Inc. and Central Maine Power. Both firms recently formed subsidiaries that invested in FiveCom, Inc., which is building a large fiber-optic network in New England.

The fiber-optic network runs from

Utilities, page 60

For every revamp, there is a season . . .

State of Michigan consolidates 19 nets, stands to save million$

By Patrick Dryden

When the state of Michigan needed a network to support its lottery, all bets were off for 19 state agencies that had operated their own independent networks.

The newly empowered information services office parlayed the lottery support network into a single, centrally managed wide-area network to streamline communications and operations among the state's departments.

"Until mid-1993, the agencies did their own thing with no economy of scale in contracting for a WAN to support about 30,000 PCs in the field," said John Kost, the state's first chief information offi-

Michigan, page 62

Peter Yates

John Kost, *CIO for the state of Michigan, says by consolidating the agencies' independent networks into one, the state will cut its total networking costs from 40% to 50%*

Firm drops Vines for NT Server

By Laura DiDio

When Logicon Communications Technology, Inc. in Arlington, Va., found that communications across its Vines network bogged down, the company switched to Windows NT Server.

Logicon supplies communications gear to various military organizations — particularly the U.S. Marine Corps — and had been a Banyan Systems, Inc. Vines user for more than four years.

But by last summer, Bruce Smith, systems administrator at Logicon, realized the company's increasing use of large database applications necessitated a "rapid network redeployment."

The database applications were taxing the Vines 5.5 network beyond its limits, he said. Response times for even routine network tasks, such as logging on and using electronic mail, were unacceptably slow.

Logicon chose Microsoft Corp.'s Windows NT Server because of its strength as an applications serv-

NT Server, page 62

Services aimed at U.S. multinationals

IDG NEWS SERVICE
BOSTON

Telecom South America recently launched a slate of telecommunications integration services aimed at U.S. multinationals that do business in South America.

Telecom South America is the U.S. arm of Teleductos, based in Santiago, Chile. The company is a local carrier in Chile with its own fiber-optic network, according to Karl Faller, CEO and president of the firm.

The company also designed the networks used by both Chilean stock exchanges.

The firm has acted as a systems integrator in most South American and Latin American countries, according to Faller.

Telecom South America will provide users with planning, design, implementation and management of wide-area networks from South American countries to the U.S.; enterprise networks within South America; and network services such as call center management. It will also serve as a single point of contact for customers, company officials said.

Giving users one place to call when trouble strikes is a key service that the company offers, according to Faller.

"If there's a break in service, the information technology manager in the U.S. doesn't have to get on a plane" and fly down to fix it, Faller said. "We can do it because we're there."

Telecom South America has more than 150 employees in Chile and six in the U.S., Faller said.

Utilities

CONTINUED FROM PAGE 59

Hartford, Conn., to Springfield, Mass., to Portland, Maine. FiveCom will begin to sell services along the Hartford-to-Springfield leg of the network next month.

"We're looking to expand the capabilities of our traditional electric business and provide a higher earning for our shareholders," said John Boyd, chief networking technologist at Northeast Utilities.

Northeast Utilities is no stranger to leading-edge technology and practices. The company was among the first to implement frame-relay and Asynchronous Transfer Mode technology in its private network.

Utilities will have to plug away

Utility companies face an uphill battle in their efforts to give users an alternative to traditional local and long-distance carriers.

Among the challenges is matching marketing, staffing, service and support with carriers that have built this infrastructure over the years.

"They really need to attract management that has vision and align with suppliers who can deliver the products and backbone [services] users need," said Traver Kennedy, director of WAN research at Aberdeen Group, Inc., a consultancy in Boston.

One analyst said the utilities have an important advantage over traditional carriers.

"They have customer access, in that they have a higher number of customers than any single long-distance company does," said Thomas Jones, president of New Venture Directions, Inc., a consultancy in McLean, Va. "People certainly don't have a warm and fuzzy feeling about utility companies, but they're a known entity."

—Kim Girard

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If we built a $36 million telecommunications network in the Russian

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New Products

DataTrax Systems Corp. has introduced Foreseer, a Windows 95-based, client/server application for managing foundation equipment.

According to the Louisville, Colo., company, Foreseer can monitor and manage all foundation equipment, including uninterruptible power supplies, batteries and alarms. It provides configurable software tools to predict and prevent systems failure.

The Foreseer client provides access to the data stored in the DataTrax server, which lets users customize views to choose configurations.

Pricing for the ForeSeer client starts at $3,995.

▶ *DataTrax Systems*
(303) 665-1030

DYS Analytics, Inc. has announced DYS Analyzer for Lotus Development Corp.'s Notes.

According to the Newton, Mass., company, DYS Analyzer for Lotus Notes gives Notes managers and administrators the means to manage large-scale, enterprise-wide replication. DYS Analyzer for Lotus Notes monitors and alerts administrators about missed and delayed events and other systems aberrations. Its diagnostics tools were designed to monitor performance trends over time and identify systemic problems.

The product's back-end server collects data from one or several Notes servers in an environment. The front end is a diagnostics package that runs on a Notes client. Pricing is based on network size and starts at $10,000.

▶ *DYS Analytics*
(617) 630-8420

Shomiti Systems, Inc. has introduced the Century family of LAN analyzers.

According to the San Jose, Calif., company, the Century line lets network managers capture and analyze all forms of switched 10M and 100M bit/sec. Ethernet traffic at full wire-speed on switch-to-switch and switch-to-server connections.

The Century family was designed as a scalable system that can be configured as software only or as software plus hardware to create monitoring and analysis systems.

The family of products comprises software, hardware and accessories that can be mixed and matched. The products can be used as a line-rate LAN analyzer for up to eight switched 10M/100M bit/sec. Ethernet segments, as a full-duplex analyzer, as a portable analyzer and as a low-cost, distributed software analyzer.

Pricing for the Century line of products starts at $399. More information is available at Shomiti Systems' home page at www.shomiti.com.

▶ *Shomiti Systems*
(408) 437-3940

Software Partners/32, Inc. has rolled out StorageCenter 2.3 with support for Microsoft Corp.'s Windows NT.

According to the Topsfield, Mass., company, StorageCenter 2.3 is a storage management software suite that features four integrated applications: Backup and Restore, Media Management, Archiving and Administration.

It was designed to manage an unlimited number of CPUs and storage devices. The latest release lets Windows NT workstations or servers back up any supported platforms.

StorageCenter 2.3 offers complete backup for NT file systems, including security attributes. Pricing for a workgroup version starts at $1,875.

▶ *Software Partners/32*
(508) 887-6409

Silicom Connectivity Solutions, Inc. has introduced TokenModem, a multifunction PC card.

According to the Redmond, Wash., company, TokenModem gives users a simultaneous high-performance Token Ring LAN connection with 28.8K bit/sec. data modem and 14.4K bit/sec. fax modem capabilities.

TokenModem includes connections for data/fax modem lines and Type 1 shielded twisted-pair and Type 3 unshielded twisted-pair lines.

It supports many types of network platforms, so users can connect to LANs, mainframes and IBM AS/400 machines.

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Spectrum warehouse consolidates net data

By Patrick Dryden

Users of network management tools from Cabletron Systems, Inc. will get help coping with data glut later this year.

A data warehousing option will let administrators consolidate network information in the database of their choice and streamline the creation of reports, officials said last week.

The problem being addressed is that both the Spectrum system for managing networks and the SecureFast Virtual Network Server for building and managing switched virtual networks archive data separately in custom databases.

So administrators of large networks can't keep all the historical data they need to understand performance patterns and document usage.

Network management

"Currently, we must limit the amount archived by Spectrum, which filled a 10G-byte disk in four months. And we need to track the virtual networks over time to see how much they grow and are used," said James Wiedel, director of networking at the University of Southern California in Los Angeles.

Operators at the university must delete old backups to free space for the historical data needed to track load changes. They could dump all that data to tapes, but that option reduces accessibility, Wiedel said.

"It will be absolutely easier to crunch on data in the warehouse, and we can apply the database tools we're familiar with," Wiedel said.

The upcoming Spectrum Data Warehouse will let administrators gather archived management data from Spectrum and SecureFast servers.

They can store and examine this information in Oracle, Sybase, SQL Server and other popular databases.

Upgrade needed

First, however, Cabletron's users must upgrade Spectrum to Version 4.0 with its distributed data manager, which enables reporting on a server-by-server and a networkwide basis.

Some key users received Spectrum 4.0 in April, and general release begins next month.

"Later this summer, the data warehouse extension will let users eliminate the need to keep as much online at each site with a management server," said Jeff Ghannam, development manager for Spectrum applications at Cabletron in Rochester, N.H.

The central repository will constantly collect management information to the database of the user's choice, then make it available for analysis by familiar report tools and other applications, Ghannam said. To handle the volume and complexity of management data, Cabletron is augmenting its own database technology with ObjectStore from Object Design, Inc. in Burlington, Mass.

NT Server

CONTINUED FROM PAGE 59

er, its ease of use and installation and the cost savings compared with Novell, Inc.'s NetWare 4.1, Smith said. "Even the Banyan sales representative privately advised me to go with NT Server," he added.

"Large databases and ease of use were our top priorities," Smith said.

The communications databases accessed by the Marine Corps contain crucial information about the Department of Defense's chain of command. The databases also allow various military services to authenticate data about transmissions, operations, maneuvers and any military conflict, Smith said.

Windows NT Server seemed the logical choice because Logicon already was using Microsoft's SQL Server database.

Smith said that while the initial cost of the NT Servers, to support Logicon's 10,000 users, is "a bit more" than NetWare 4.1, it was well worth it. Before making a decision, Smith tested NT Server and NetWare 4.1 and also consulted with other departments within Logicon that have NetWare. He concluded that NT Server offered better ease of use and administration than did the Novell network operating system.

"Just by reading the NT Server manual, I learned 80% of what I needed to know to configure and maintain my servers. NetWare 4.1 [installations], while getting easier, according to our network administrators, are still much tougher than NT Server," Smith said.

In fact, Smith said, NT Server saved Logicon several thousand dollars for each of its more than 50 servers because of the integrated services such as remote access and TCP/IP capabilities that Microsoft bundles into the network operating system.

Another factor that tipped the scales in NT Server's favor was that while NetWare 4.1 "can run and handle more users per server than NT Server, its database support is far more expensive and not nearly as robust as the Microsoft platform," Smith said.

Logicon's end users also saw immediate improvements in network operations. Bob Gose, a senior systems analyst, said he saw a "tremendous pickup in processing speed" with Windows NT Server 3.51 compared with Vines 5.5.

"Toward the end of our Vines usage last year, everything — even the most routine applications — was getting bogged down," Gose said. Logging on and word processing were difficult, "and forget about accessing the database applications," he said.

Using NT Server is "like going from a four-cylinder to an eight-cylinder car. You don't see what's under the hood," Gose said. "You just know it's a more powerful engine when you go to do something."

Michigan

CONTINUED FROM PAGE 59

cer. Bidding for the state's lottery network stipulated that the winner would also consolidate agency networks into one with the latest digital capabilities. The winner of this Michigan jackpot, Chicago-based Ameritech Corp., helped Kost's commandos build a network service based on a utility model, "so we could begin to do business like an interconnected organization instead of 19 separate fiefdoms."

Network consolidation

The lottery project served notice that the state had one purchasing and decision-making authority in charge of networks. Acceptance spread as agencies cut over to the state network, partly because comfortable state budget conditions allowed each subscriber to reassign, not lay off, redundant operations staff and control its LANs.

"Opposition quickly evaporated, not just due to the governor's order but from the realization that everybody can get better service and pay less money for it," Kost said.

Governor John Engler set the stage back in 1992 for joining the state's networks and other rightsizing projects, such as consolidating multiple data centers.

He was frustrated by complaints from his agencies that their older technology and inability to communicate with outside departments prevented them from taking action. So he created the CIO position and a staff of about 400 under Kost.

That bet has paid off in many ways.

For example, scrapping 40 T1 links in favor of a few faster, more efficient T3 circuits reduced telephone line charges for each agency, according to telecommunications managers. Now the year-old Consolidated Network Operation Center (CNOC) in Lansing provides around-the-clock control of all connections among offices in the capital and to remote sites.

"Unifying all the WANs will return about $3 million to the state in network management costs," said Bryan Ruhf, CNOC manager.

And state employees can communicate through a single electronic-mail system.

Cooperation with the central network authority appears to be increasing. Users in the Department of Natural Resources, known for their independence, sought help from Kost's organization to reach remote offices.

They needed to improve communications with remote field sites, so they turned to the new central design, purchase and support structure to save time and trouble.

"Initially, the agencies are reinvesting savings to pay for service upgrades, but we expect to cut total networking costs from 40% to 50%," Kost said.

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Sun

THE NETWORK IS THE COMPUTER™

Communications, computer science pioneers predict the future, 70

The Internet

Concentric promises high-speed private Internet network

By Mitch Wagner

Concentric Network Corp. plans in late August to launch a private Internet network that offers response times of less than one-fifth of a second between points in any of 150 major U.S. cities.

But there's a catch: All the communicating parties must be customers of Concentric, a national Internet service provider.

Concentric's high-speed network consists of the following:

- **20 concentrated points of presence (POP) – or Super-POPs – that provide local access for 150 metropolitan areas nationwide**
- **ATM backbone network that operates at 45M bit/sec. to 150M bit/sec.**
- **Backbone connects to POP at T1 speeds of 1.5M bit/sec.**

Officials at the Cupertino, Calif.-based company hope the network will appeal to businesses that want to set up intranets between corporate campuses or business-to-business private networks running Internet applications.

High-speed access will be available at up to T1 speeds, or 1.5M bit/sec.

The company has yet to set precise rates but said they would be competitive. The standard for Internet T1 connections costs roughly $2,000 to $2,500 per month. Concentric will offer dial-up access for $19.95 per account per month, which is common pricing.

Founded in late 1994 by former staffers at Sprint Corp., Concentric has received about $100 million in private funding. It sank most of that investment into building a private Asynchronous Transfer Mode network, incorporating proprietary technology designed to give priority to traffic that requires a high degree of response time, such as videoconferencing and real-time audio.

Concentric wouldn't provide specifics on how the technology works.

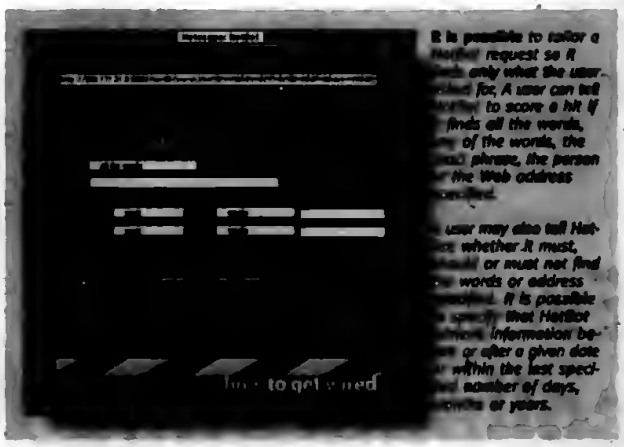
Response times

Concentric's claimed response time of 200 msecs is nothing new. But guaranteed 200 msec response times between 150 locations is unprecedented, observers said. So much so that they were skeptical that Concentric could meet its claims.

"It's easy to make claims like this," said analyst John Maloff, president of Maloff Co. in Dexter, Mich. "Nobody has been dumb enough to try to promise this before."

"This is for real?" asked Randy Schultz, a network administrator at Plastomer, Inc. in Livonia, Mich. He said if Concentric can deliver on its promises, it will have produced technology useful to all Internet users. "It will be useful to anybody who's gotten used to waiting for things to happen on the Internet," he said.

Inktomi says its HotBot search engine can keep up with the growth of the Internet



Keeping pace

By Gary H. Anthes

The trouble with a lot of Internet tools and technologies is they don't grow with the 'net; something that worked well last year may be a dog now that the Internet is twice as big.

But now a tiny Berkeley, Calif., company named Inktomi Corp. has introduced an Internet search engine that it says can keep pace with Internet growth simply by adding more workstations to its parallel processing search network.

Inktomi said HotBot, which can be found at www.hotbot.com, indexes the entire World Wide Web of some 50 million pages — about twice the number of the reigning champion search tool, Digital Equipment Corp.'s Alta Vista.

"Alta Vista's key capability has been its brute force, the fact that it catalogs an enormous amount of information," said Ted Julian, research manager for Internet commerce at International Data Corp. in Framingham, Mass. "HotBot is outdoing Alta Vista."

Flexible options

Mindful that a query that produces 10,000 hits may not be such a hit with users, Inktomi has built in unusually powerful and flexible options for targeting requests and filtering results.

"It's pretty neat," said David Folger, a program director at Meta Group, Inc. in Burlingame, Calif. "It has options I like, such as looking for things that have changed in the last X days or choosing what country to search in."

The good news is HotBot is free. The bad news is users will have to put up with some advertising.

HotBot, *page 70*

'Domino' server to deliver Notes from Web browsers

Lotus Development Corp. last week unveiled more specifics about its plans to let customers access Notes from World Wide Web browsers.

The company announced that a new Notes server, code-named Domino, with native support for Hypertext Transport Protocol, will begin beta-testing from a Lotus Web site (domino.lotus.com) next week. The server, first announced in January, will let users combine a Notes groupware server and Web server in one box.

Notes surfing

At the same time, Web site designers can use Notes' vaunted security to control access to the site down to the database field level and take advantage of Notes' database features to automatically update Web page content without additional Hypertext Markup Language programming.

"Lotus is working at a frenzied pace to implement the strategy that they delineated in December and January," said Dave Marshak, an analyst at Patricia Seybold Group in Boston. "People are very interested in how real this is, and [Lotus is] going to make sure that people are aware that it's real."

The announcement comes just after Input, a consulting group in Mountain View, Calif., released a study that claims Notes has only two years of groupware market dominance left before being taken over by Web technologies.

Domino needs a Notes 4.x server and will be a free addition to Notes 4.x.

Computerworld *senior writer Tim Ouellette and Sari Kalin of the IDG News Service contributed to this report.*

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Predicting the future

Industry pioneers ponder software robots and a 'collapsing' Internet

By Gary H. Anthes
WASHINGTON

"Predicting the future is easy," said Howard Frank, director of the Information Technology Office at the Defense Advanced Research Projects Agency in Arlington, Va. "Getting it right is the hard part."

But that didn't stop Frank and a bevy of computer and communications pioneers from offering their views of what users can expect over the next decade. The experts also paused to reflect on technology's past at the 10th anniversary celebration of the National Research Council's Computer Science and Telecommunications Board here recently.

"I am fascinated by the World Wide Web [and] am much sobered by the fact that no one predicted its occurrence," said Bellcore luminary Robert Lucky. "It seems to me almost a case study in chaos theory.

"There was a time at Bell Labs when 'the future' was 10 years out," Lucky added. "Now it's two weeks."

Despite the difficulties, board members and their invited guests — collectively a Who's Who of computer and communications pioneers — pondered and prognosticated the future of their field. Their observations include the following:

- "One billion people will be on the Internet in 2000; that we know. What we don't know is what they'll do with it," said Lucky, corporate vice president of applied research at Bellcore in Livingston, N.J.
- "We need to fix the Internet. It's on the verge of collapse. Intranets are proliferating because the Internet offers inadequate security and reliability," said Robert Metcalfe, vice president of technology at International Data Group in Framingham, Mass.
- "Silicon has driven us forward. Will the World Wide Web be the next driver?" said David Clark, senior research scientist at the MIT Laboratory for Computer Science in Cambridge, Mass.
- Digital libraries will be a key development. "We are working on technology but not content. We need to get all the authored works of mankind online," said Raj Reddy, dean of the School of Computer Science at Carnegie Mellon University in Pittsburgh.
- "We need post-WIMP [Windows, icons, mouse and pointing] interfaces." That would include speech recognition, hand- and eye-tracking, software agents and high-bandwidth continuous input, said Andries van Dam, computer science professor at Brown University in Providence, R.I.
- Two key developments will be "adaptive agents," or software robots, and software productivity tools. "We need large, distributed artificial intelligence systems, not lamppost systems," said Edward A. Feigenbaum, chief scientist at the U.S. Air Force.
- "I think the future is rather dim. Computer science education and [university] research is narrow and tired and basically obsolete. Long-term R&D in [information systems] in the U.S. is in decline. High-end strategic computing is in decline. The Internet is moving into a period of decline," Frank said.

But at least one member of the Computer Science and Telecommunications Board scoffed at the naysayers. "We just had a breakthrough with the World Wide Web," said Butler Lampson, a senior software architect at Microsoft Corp. in Redmond, Wash. "How many breakthroughs do you need in one decade? What's all the bitching and moaning about?"

Katherine Lambert

"I think the future is rather dim. Computer science education and [university] research is narrow and tired and basically obsolete."

— Howard Frank, director of the Information Technology Office at the Defense Advanced Research Projects Agency

Dennis Ludwig

"We are working on technology but not content. We need to get all the authored works of mankind online."

— Raj Reddy, dean of the School of Computer Science, Carnegie Mellon University

HotBot helps keep pace with 'net

CONTINUED FROM PAGE 67

Inktomi teamed with HotWired Ventures, the online extension of *Wired* magazine, to create HotBot. HotWired will market advertising space on the search engine's displays.

HotBot runs on a network of 10 Sun Microsystems, Inc. UltraSPARC workstations. Using proprietary software distributed over the network, indexes and searches use multiple processors simultaneously. As the Web grows, Inktomi will scale up the search network by adding more workstations, company officials said.

Also in the works

Inktomi is likely to develop a similar product for corporate intranets, according to Chief Technology Officer Eric Brewer. "A medium-size company will be able to get a one-node search engine, and when it decides it needs more power, it can just add another low-cost node," he said.

Brewer said Motorola, Inc., with 6,000 Web sites on a global intranet, has requested such a product from Inktomi.

Folger predicted there will be a sizable market for intranet search engines as intranets grow in size. He said they must have robust security built in to them so that employees can't browse confidential information.

HotBot joins a list of free search engines that includes Alta Vista, Lycos, Web Crawler, InfoSeek and Search.com. Users may want to have them all, Julian said. "They all have different flavors. Internet veterans come to know which one is best suited to the task at hand," he said.

Brief

HP expands 'net offerings

Hewlett-Packard Co. beefed up its Internet consulting offerings with turnkey, low-end World Wide Web servers and firewalls that target external corporate communications and internal intranets. The Web server costs about $15,000; the firewall costs about $20,000. HP also plans training programs.

Books about the Web, Internet

HTML for Dummies, second edition, **by Ed Tittel and Steve James; IDG Books Worldwide, Inc., Foster City, Calif.; 398 pages; $29.99.**

This is a basic introduction to Hypertext Markup Language (HTML) and the World Wide Web. It mainly targets people who are technically savvy but completely new to the Web.

It starts with simple definitions of the technology of the acronym-strewn Web and goes on to give recommendations on Web page layout, testing and Web navigation. It covers use of sound, images, video and text in Web pages and how to debug pages once they are written. It even dips in to the build-or-buy question about who should supply your Web services.

The layout guides provide helpful tips on how to use hyperlinking to build complex documents without getting site visitors hopelessly lost in a maze of undocumented links. It also includes a good-size section about Common Gateway Interface (CGI) coding to link Web pages to back-end applications.

Book reviews

A floppy disk that ships with the book contains functional examples of the HTML and CGI code examples in the book.

Like any good Web document, the book includes tons of links, in this case copious references to in-depth books on layout, scripting and the art of attracting traffic on the most unrestricted of superhighways.

Web Strategies: How to Promote and Market Your Web Site, **by Vince Gelormine; Coriolis Group Books, Inc., Scottsdale, Ariz.; 354 pages; $24.99.**

Comedian Rodney Dangerfield seems an odd choice to write the foreword for a book designed to teach readers how to get respect and traffic for new Web sites, but in this case, it seems to work. Dangerfield tells how he built an audience for his Web site (www.rodney.com) and how the book teaches the same.

The premise of the book is that savvy marketing is just as important a factor in successful Web-site building as technical excellence or editorial content.

The goal, author Gelormine said, is to help Web surfers find a site whether they are searching for it or just stumbling around. The book advises that a Web site address be listed in Yahoo, Lycos and the dozens of other Web-indexing databases. It should also appear in a company's advertising, Usenet groups and any other available marketing materials or venues.

The book includes tips on "Guerrilla PR," the art of the press release, online advertising and dozens of Web sites that could be good places to advertise or would carry links to your pages as a service to their readers.

It also gives tips on what to put on a Web site to attract repeat visitors. Fresh content can help; so can controversy. Dangerfield said his Joke of the Day and a public feud with the Academy of Motion Picture Arts and Sciences helped build a hit rate of more than a million per month.

The Internet Trainer's Guide, **by Diane Kovacs; Van Nostrand Reinhold, New York; 184 pages; $29.95.**

This book was designed to answer the question of who will train the trainers. It is a hands-on guide to Internet training, with study guides, teaching strategies and materials aimed at specific groups — including school-age children, nontechnical business people, academics and people in medicine.

It goes into detail about Internet access to Unix and VAX/VMS systems, among others, including gopher, file transfer protocol, Archie and the Web. Its concentration on non-Web access methods seems to indicate it was written before the current Web craze.

But that material may be more useful for organizations that want to teach users to access internal resources through Internet-like technologies but have yet to build a full-scale intranet. — *Kevin Fogarty*

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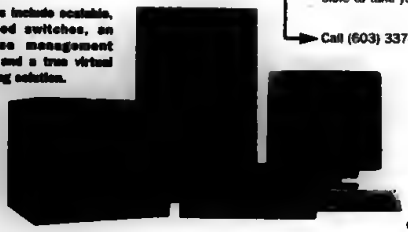

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New Products

McAfee Associates, Inc. has announced WebShield, antivirus software for network firewalls and Internet gateways.

According to the Santa Clara, Calif., company, WebShield is a transparent, high-performance antivirus scanning product that searches for Internet-borne viruses. It is compatible with all leading network firewalls and Internet gateways and was designed to provide protection against Simple Mail Transfer Protocol, file transfer protocol and Hypertext Transport Protocol traffic on a TCP/IP network.

WebShield features a dual-homed architecture, using two network interface cards for increased security. Users can get antivirus updates each month. Pricing for WebShield starts at $3,995 for a two-year subscription. More information is available on McAfee's home page at www.mcafee.com.

▶ *McAfee Associates*
(408) 988-3832

Abbott Systems, Inc. has introduced Surfboard 1.0, a uniform resource locator (URL) manager.

According to the Pleasantville, N.Y., company, Surfboard 1.0 is a software device that looks like a television remote control and lets users store and channel-surf World Wide Web addresses. Users add URLs by clicking oo addresses and dragging them into Surfboard.

Surfboard 1.0 costs $39. More information is available on Abbott Systems' home page at www.abbottsys.com.

▶ *Abbott Systems*
(914) 747-3116

Attachmate Corp. has rolled out Extra Bundle.

According to the Bellevue, Wash., company, Extra Bundle brings together host access through Telnet for IBM, Digital Equipment Corp. VAX and Unix systems. It was designed to provide a TCP/IP stack and applications, including Network File System and file transfer protocol, to access network resources, electronic mail and Netscape Communications Corp.'s Navigator.

Extra Bundle was designed to provide the same functionality for 16- and 32-bit users. Pricing starts at $195. More information is available on Attachmate's home page at www.attachmate.com.

▶ *Attachmate*
(206) 644-4010

Gensym Corp. has unveiled G2 WebMiner, a product for mining data from an organization's intranet or a World Wide Web site.

G2 WebMiner is a complementary product to Gensym's G2 software. According to the Cambridge, Mass., company, G2 WebMiner lets users mine data, perform rules-based analysis on it and then link this information to decision-making applications.

G2 WebMiner is available on Windows NT and Windows 95, OpenVMS, Silicon Graphics, Inc.'s Iris and IBM AIX platforms. Pricing starts at $4,000. More information is available on Gensym's home page at www.gensym.com.

▶ *Gensym*
(617) 547-2500

Product short

MediaMagic Solutions, Inc. has announced Instant Web Art, a software program for World Wide Web site designers that has a library of buttons, bars, icons and templates. Its six beginner templates were designed to be used instantly; advanced users can add more features with a Hypertext Markup Language authoring software program. Instant Web Art runs on Macintoshes and PCs and requires a minimum of 4M bytes of RAM. Pricing starts at $40. MediaMagic Solutions, Cupertino, Calif. (408) 777-7676.

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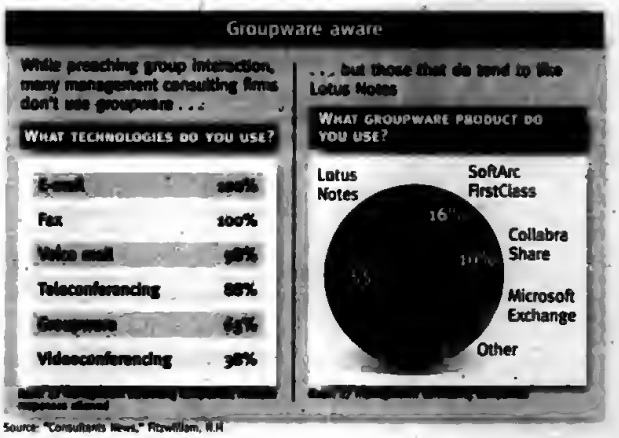
Sibuching allowed: Microsoft moves classes to 'net, 76

Corporate Strategies



Source: "Consultants News," Fitzwilliam, N.H.

Some consultancies don't do as they say

By Tim Ouellette

Groupware apparently isn't for everyone — even when your business involves promoting the benefits of groupware to corporate users.

Nearly one-third of 42 management consulting firms surveyed don't find groupware all that important (see chart), according to a recent study by "Consultants News," a newsletter in Fitzwilliam, N.H.

Groupware

"It is interesting because here are people that live and breathe knowledge and collaboration," said Byron Reimus, the principal at Byron Reimus & Associates Ltd. in Boston, who helped conduct the study.

Major management consulting firms have led the vanguard in adopting groupware technology such as Lotus Development Corp.'s Notes, Novell, Inc.'s GroupWise and, more recently, Microsoft Corp.'s Exchange. Some of the earliest and biggest users of groupware include Ernst & Young LLP, Andersen Consulting, Coopers & Lybrand LLP and Price Waterhouse.

But many consulting firms are just too small to use groupware. Others see groupware as a waste of users' time. Garnering and organizing information via groupware and other software can come at the expense of training and personal interaction among consultants, the report said.

What employees do with the data they gather doesn't necessarily add value to it, said Lance Berger, a consultant at LBA Consulting Group in Bryn Mawr, Pa. "At our billing rates, that kind of information-distribution mentality can be deadly."

And groupware often is ill-used, becoming a glorified, expensive electronic-mail system instead of a collaborative work environment.

The business focus of a consulting firm seemed to dictate how groupware was perceived, the survey found.

Firms — including the major players mentioned — that use a set of specific methodologies to handle problems are inclined to have a technology focus and use groupware as an extension of E-mail.

But firms that are more expert-driven — depending on the personal experience and skill of members to handle problems individually — are more inclined to use technology in a support role rather than as a replacement for face-to-face interaction. These firms, not all of which were small, also used videoconferencing more often to promote personal interaction.

Though groupware can be cost-intensive with training and application development efforts added in, many users of the technology weren't concerned with hard return-on-investment numbers.

"We have not looked at the impact of these efforts quantitatively. We did it as a strategic initiative," said Charles Paulk, chief information officer at Andersen Consulting. A more important barometer of groupware's success is whether the firms are delivering answers to their clients faster, he said.

CBS served well by client/server

By Thomas Hoffman
NEW YORK

CBS Radio Networks' new client/server system was designed to fully automate business operations at its 1,200 AM and FM affiliate stations.

The custom system, code-named Airwave, will for the first time tie together a wide variety of CBS Radio's business functions. Those include research, planning, sales and program scheduling. In the past, those functions ran as independent file systems on IBM 3090 and IBM 9287 mainframes in CBS' Secaucus, N.J., data center.

Airwave will let CBS Radio retrieve sales and advertising information from affiliate stations overnight. Under the old batch system, that process often took up to three months, said Richard Silipigni, vice president of sales at the radio network, a division of Westinghouse Electric Corp. subsidiary CBS, Inc.

CBS Radio's Paul S. Bronstein: *'The only way we can grow the programming is to add a new system'*

The system will also enable CBS to "regionalize" its advertising — a feature that advertisers like because they have become more selective about the markets they target, Silipigni added.

The new system, which is being built by Comtex Information Systems, Inc. in New York, is expected to help CBS keep up with the fast-paced and highly fragmented talk radio market. In addition to David Letterman's daily Top 10 List, which it launched 18 months ago to 270 U.S. markets, CBS Radio in January added political commentator Mary Matalin's weekday talk show. That program has found a home in 50 markets.

Trailing in talk

ABC Radio Networks is out in front of its two primary network competitors — CBS Radio and Westwood One — with its breadth and volume of nationally syndicated talk radio, sports and music programming, said Marty Green, general manager at WAYY-AM in Eau Claire, Wis., and a

Client/server, *page 76*

Software lets newspapers get classified ads via the Internet

By Sharon Gaudin

Gannett Newspapers, Inc. uses innovative software to give real estate agents more control over their advertisements while cutting its production costs.

Now the newspaper giant is taking the system onto the Internet.

Web commerce

Software engineers at Gannett Media Technologies (GMT), a wholly owned subsidiary of Gannett, are World Wide Web-enabling AdLink software, which lets real estate agents design advertisements from a computer in their office.

"Newspapers scan in hundreds to thousands of photos and key and rekey ad copy every week. This software cuts all of that out," said Steve Burns, a vice president at GMT. Real estate agents "get control over their ads so they advertise more. Newspapers get more advertising dollars and less work."

Burns and his co-workers developed AdLink by using Magic Software Enterprises' application development tool.

"AdLink cuts out a lot of work for us," said Dave Hunke, vice president of advertising at the Gannett-owned *Cincinnati Enquirer*. "It's reduced our labor costs and . . . allowed us to reallocate our hours and resources."

Newspapers, *page 77*

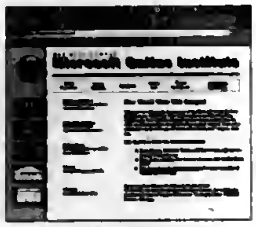
Slouching allowed: Microsoft classes move to 'net

By Mitch Wagner

Do virtual classrooms include a virtual guy in the back of the room throwing virtual spitballs?

Information systems managers will get a chance to find out. Microsoft Corp. has announced it will offer training on the Internet for managing Microsoft software and will deploy and run Internet technology.

Microsoft, which has moved its Microsoft OnLine Institute from The Microsoft Network (MSN) to the Internet, went into open beta testing of the program six weeks ago. A second round of beta testing is due late this month, and the institute will open its virtual doors to the public by late summer.



The Microsoft OnLine Institute *will begin sessions on the Internet by late this summer*

Courses are available in Windows 95 and Windows NT administration, building Internet sites and programming in Visual Basic, among other topics. Students interact with teachers through Internet Relay Chat (IRC) in virtual classrooms of about two dozen students who meet a couple of times each week.

Class chat

Classes range in price from $200 for a two-week Internet instruction class from Valinor, Inc. to $900 for a nine-week Windows 95 administration class from Aris Corp. Students sit at their own PCs in their homes or offices, log on to the Internet at appointed class times and interact with ooe another and the instructor over IRC.

Students need to provide their own IRC clients, which are available on the 'net from software and shareware companies for common platforms.

Microsoft's moving of online instruction from MSN to the Internet is part of its overall strategy to move all of MSN onto the 'net to attract the broader audience available there.

Microsoft and its partners are pioneers in offering interactive training on the Internet, although similarly structured education programs have run on a small scale on online services.

Robert McIntosh in Rome, Ga., was part of the first beta program in Windows 95. He said the program gave him access to a live instructor and also let him take the classes at his own pace and at a time and location convenient to him.

The online venue is an asset to students who have difficulty learning in a classroom setting, McIntosh said.

"Classrooms remind some people of when they were in the fourth grade, and the teacher caught them staring at the girl who sat three rows down," McIntosh said.

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Client/server serves CBS Radio well

CONTINUED FROM PAGE 75

30-year industry veteran.

Talk radio took off in the late 1980s when Rush Limbaugh's conservative daily broadcast spread like wildfire across the U.S. But for radio networks such as CBS and ABC, oetwork news is still the base product, "and there are far fewer stations that are playing news these days," Green said.

As a result, sales of network programs to affiliate stations have become CBS Radio's primary growth vehicle. Because CBS is a relative oewcomer in the syndicated talk radio arena, revenue from those programs represents "a very small percentage" of its total sales, said Christopher Dixon, an analyst at PaineWebber, Inc. in New York.

Programming restrictions

The mainframe systems CBS Radio had been using were rigid and constricted the network's ability to expand programming, according to Paul S. Bronstein, vice president of research at CBS Radio Networks. "The only way we can grow the programming is to add a new system."

CBS Radio had been using an IBM CICS/PL/1 database system called Showbiz that it built 15 years ago to support its affiliate operations. But most Showbiz functions — such as invoicing, creating sales plans and generating research data — were done manually. Under the Airwave system, those jobs will be automated.

Last month, CBS Radio began using the first release of the Airwave system, which automates sales and programming. When the new affiliate database goes online in July, the network will be able to track the use of its programs from end to end. That will help CBS keep a closer eye on all its business activities, including advertising, scheduling and promotions.

Bronstein wouldn't disclose the cost of the Comtex system or the mainframe hardware savings it is expected to generate.

CBS Radio Networks

- **Challenge:** To expand the reach of its network programs throughout its 1,200 AM and FM affiliate stations by automating and integrating back-office functions such as research, planning, sales and program scheduling.
- **Solution:** Customized client/server software from Comtex Information Systems that uses Windows 3.1 front-end systems developed with Sybase's PowerBuilder and Compaq's ProLiant servers running Windows NT.
- **Anticipated results:** End-to-end tracking of network programs, advertising and other functions; ability to support the growth of CBS Radio Networks' program cache.

Newspapers get classifieds via 'net

CONTINUED FROM PAGE 75

Hunke, who has hired three new people for his sales staff with the money he saved in the classifieds department, wouldn't say how much it cost to set up the system or how much revenue he attributes to it.

"It was a very immediate return on investment, one we realized in the first year," he said. "When I add up the extra pages and the new clients, it absolutely is making us money."

GMT, which is developing AdLink for automotive and employment ads, is moving its classifieds concept toward the Internet.

Burns said that in a few months, house shoppers will be able to call up the *Cincinnati Enquirer*'s Web page and find listings for hundreds of homes. "Web surfers will be able to search a particular part of the city or in a particular price range," explained Burns, who added that three or four Gannett papers already are online with this kind of information.

Gannett is using AdLink in about 22 of its newspapers and has sold the technology to eight papers outside the chain.

Morley Piper, executive director of the New England Newspaper Association, said Gannett is on the leading edge of the technology curve.

"Everyone coming on the Internet is into a new scheme," Piper said. "Some newspapers have been slow to react because they think it gives too much access to their data. But I think a lot of papers are going to take advantage of AdLink-like technology. It's definitely coming, if not already here."

Briefs

Congress hears year 2000 testimony

Executives from IBM, Computer Associates International, Inc., Electronic Data Systems Corp. and other industry experts recently testified before the U.S. House of Representatives Subcommittee on Science about the impact that the year 2000 programming glitch will have on business and government agencies. Experts said they believe that millions of lines of date-sensitive programs will fail on or before Jan. 1, 2000 because most computers will read all two-digit date fields as referring to years in the 20th century. Peter de Jager, a year 2000 guru in Brampton, Ontario, told the panel that fewer than 35% of North American companies have begun to address the problem. Full testimony from the hearings can be accessed at www.house.gov/science/welcome.html.

SEC online

Edgar Online selected First Virtual Holdings, Inc. in San Diego to provide the online transaction processing system for the investment information service. Edgar Online is a private firm that has licensed access to the Electronic Data Gathering, Analysis and Retrieval (EDGAR) database, which contains all Securities and Exchange Commission (SEC) filings from U.S. corporations. Earlier this month, the SEC required all public companies to file corporate information electronically to EDGAR. More information on Edgar Online can be found at www.edgar-online.com.

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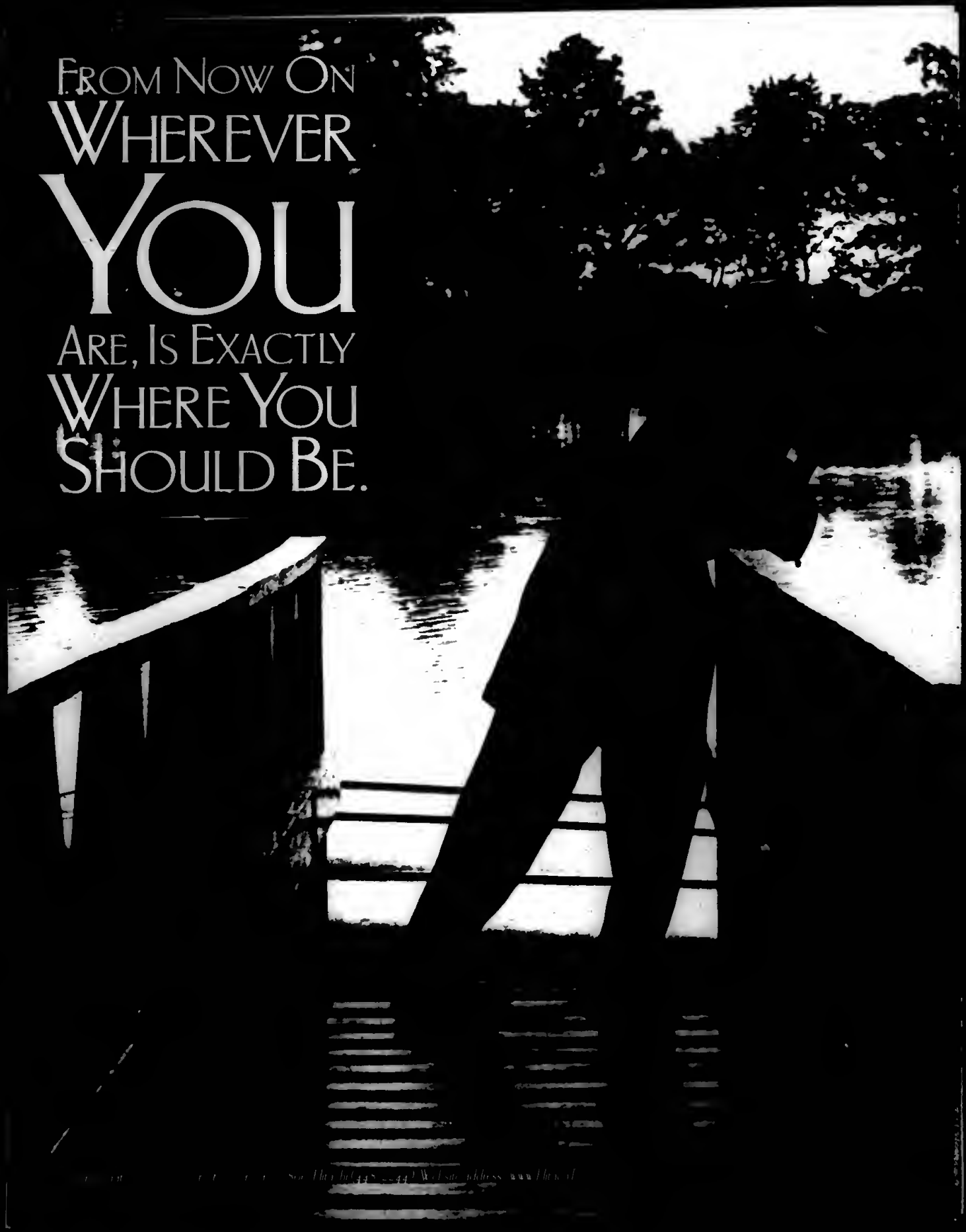
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intel inside pentium

They yearn

IS staffers stay up to keep up

It's 11 p.m. Do you know where your developers are?

If they aren't still at their desks or in the data center, they're probably on the couch at home reading the documentation for Oracle Corp.'s Oracle7 or a study about outsourcing. Such long hours may be expected of those working their way into management or struggling with a deadline. But continuous learning — as in around the clock — is also becoming routine for rank-and-file information systems staff members.

The motivator in some cases is fear of becoming obsolete or losing out in the race for company-paid training. At Chubb & Son, Inc. in Warren, N.J., training budgets are rising 15% to 20% per year, but IS employees are still "reading more and doing more on their own," says Assistant Vice President Phil Kaufman. That's because most training goes to help people on projects to which they're already assigned. But to get assigned to the best projects in the first place, it helps to have "a bit of a leg up" on the technology to be used, he says.

Other IS staffers are more self-motivated. "I'm fairly driven" when it comes to retraining, acknowledges Jim Robinson, a programmer and analyst for the municipal government of Kansas City, Kan. Driven for him means spending about 15 hours per week on course work for his MBA and another five to 10 hours reading technical publications and manuals, even as he holds down a full-time job and shares housework with his wife. When homework and housework collide, he says, "it's insanity. That's when I end up with one or two or three hours of sleep a night."

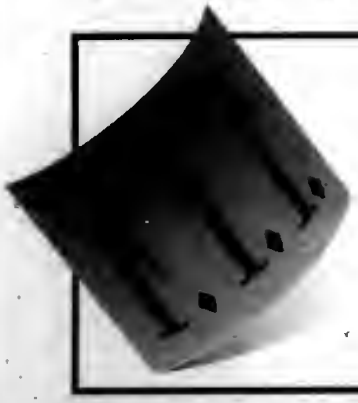
Stephen Yusi knows that feeling well. He joined beauty-care products manufacturer Avon Products, Inc. five years ago as a mainframe computer operator and later volunteered for company-run introductions to Microsoft Corp.'s Windows and Excel. That helped him land his current job as mid-range and client/server support analyst. He spends three to four extra hours per day at work and a half-day on Sundays learning five server operating systems and teaching others what he's learned.

The late shift: *Jim Robinson, a programmer and analyst, spends about 15 hours per week on course work for his MBA and another five to 10 hours reading technical publications and manuals*

All that time away from family can be difficult for someone with a 10-year-old stepdaughter and a child on the way, but Yusi isn't complaining. Nor is he driven by fear, he claims. "The technology is just amazing," he says. "Once I can bulletproof the processes we have ... we can look further into how the new technology can help Avon. That vision is really exciting and what's driving me."

"If you really want it so badly, you'll find the time. You'll find the energy," says Tania Zamora, a programmer and analyst at Imperial Holly Sugar Co. in Sugar Land, Texas. His managers are taking a closer look at training before approving it, but "that doesn't stop me." He gets paid to learn by spending 15 hours per week on his own developing applications for outside clients and another 10 hours reading technical material or fiddling on his home computer.

"I don't golf, I don't play pool, so that's basically my hobby," he says. And, he might add, his job security.



Cyber-sniping at the boss

IS managers beware! Your employees may be talking about you behind your back in cyberspace.

Workers can vent their anger and sarcasm on the My Boss home page (www.myboss.com) by telling their favorite "My boss is a jerk because ..." story. Names are omitted to protect the guilty.

Samples include the following:

- "The leader of our company's technical services group once told ... his employees, 'Our clients have been telling us for four years that we're slow to respond.'"
- "Our data center was trying a new lights-out procedure, and some big-wigs stopped by. . . . One of the big-wigs asked me to hit the light switch. Well, my supervisor heard the re-

Intranet pioneers to IS: Let your users do the posting.
Page 82

to learn

There's never enough time for training. Here's how IS staffers and their managers squeeze in study time during the day — and night.

By Robert L. Scheier

IS managers battle the clock

"There are no more 40-hour weeks," Mike Abbaei says. "If a person wants to be successful, it doesn't matter at what level, they need to understand that their work and their lives are interchangeable."

Abbaei, senior vice president and chief information officer at investment bank Legg Mason Wood Walker, Inc. in Baltimore, isn't being cruel. He's just stating facts. Between ever-increasing work demands and a faster flow of new technology, it's impossible to get the regular work done and update your skills in a 9-to-5 day.

Time, not money, is often the biggest hurdle to keeping current on skills. In fact, U.S. organizations spent 11% more per person in IS training last year than in 1994, and technical training grew from 3.8% of IS budgets to 4.9%, according to a study by International Data Corp., a market research firm in Framingham, Mass.

"The real cost companies are resisting is [the cost of] taking people away from the job to go to an instructor-led workshop," says Cliff Hallberg, managing principal at The Interpersonal Technology Group, Inc., a training firm in Rockville Center, N.Y. So IS managers are looking for ways to squeeze training into the workday or help employees train on their own time.

Many companies want to switch from formal classes to training "delivered at the desktop via the LAN," so employees can learn during breaks or at lunch, Hallberg says. Others, such as The Kendall Co. in Mansfield, Mass., a producer of products for health care and other industries, split class time between work hours and personal time. Some classes, for example, run from 1 to 9 p.m. "It's a long day for people," says Steve McManama, corporate director of IS. "But you don't lose them [to training] for the entire day."

Kendall also holds informal sessions in which vendors or members of Kendall's IS staff give presentations in various technology areas. Roy Wilsker, director of technology planning, says the vendor presentations are a cost-effective way to train his staff in new technologies. Briefings by Kendall's IS staffers give them valuable experience formulating, presenting and defending their ideas before groups, he says.

Kendall also gives its IS staff a technology road map, a set of documents that list current and future technologies important to Kendall's business. Employees use the road map to plan their own training efforts.

But sometimes company-paid training is the only way to go. The managers of a help desk operation at United Parcel Service, Inc., for example, send 10% of their 175 technicians to training all day, every day. The cost: $3,000 per day. The savings: $26,500 per day because the technicians can solve problems more quickly thanks to the training, says Mark Buneo, site manager of external customer support at UPS' World Class Support Center in Mahwah, N.J.

Since the heavy training began in early 1993, he says, the average help desk call has shrunk from nine minutes to five, and the rate of problems solved on the first call is up from 60% to 92%.

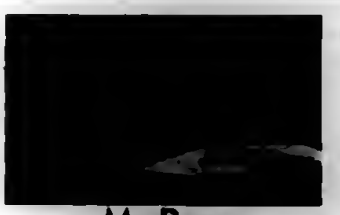
Can other IS functions get the same kind of bang for their training buck? "You just need the commitment from management," Buneo says. "You're going to see an initial cost increase, [but] obviously there's a payoff at the end." ■

Scheier is *Computerworld*'s senior editor, management.

Tips for the boss

- **Arrange after-hours briefings by in-house experts**
- **Invite vendors to give technology briefings at brown-bag lunches**
- **Give employees "road maps" of which technology they should learn**
- **Supplement, don't eliminate, company-provided training**

quest and made some snide remark about having to do it herself. So she . . . approaches the switches. One is your everyday . . . light switch. The other is an 'Emergency — room power off' switch that is red and inside a plastic case. It also has a safety pin that must be removed first. Shortly after . . . the whole room went black. Oops! Wrong switch. She took down



My Boss

One thing is true. Whether yesterday, today or tomorrow at some point in your life you will say, my boss is a "[illegible]!"

all the computer systems with her stroke of genius."

This is from the one-liners category:

- "He thinks he can push himself forward by patting himself on the back."

But thick-skinned managers can have a blast. You can nail your own boss, log in for some laughs or vote for the most hilarious or incredible story, one-liner or cartoon of the week.

My Boss also offers tips on job-hunting and starting your own business. And there's a dour side to the page: a Layoff Scoreboard and Statistics of Pain that detail the hard facts of downsizing — with a little attitude. — *Rick Saia*

More F.Y.I., *page 86*

The bad news: You can't control everything that goes on your intranet. The good news: You may not have to.

By Robert L. Scheier

Let Go!

So your users want an intranet, and you're worried. Like any information systems veteran, you figure this means more work and hidden costs for you. What will an intranet do to your network? Who will decide what can be posted? Who will find that data and convert it to Hypertext Markup Language (HTML)? Who will maintain and update the data so the site stays useful?

Relax, say pioneers who already manage intranets. This is one time when users are willing, able and even eager to do a lot of the work themselves. At least at this early stage of intranet adoption, it's safe, relatively inexpensive and comparatively easy to let users create and maintain the content.

Unlike World Wide Web sites, a properly secured intranet will be seen only by employees so managers should "take off the reins" says Steve Heit, network development manager at United Parcel Service, Inc. in Atlanta. "Give your departments the tools and latitude to experiment."

Experimentation sounds risky to network managers who wonder what all that data will do to their networks. Rodney Baker, a product manager at Electronic Data Systems Corp. in Orlando, Fla., got around that problem. Rather than put about 500 Web-accessible pages on a Web server, he stored them as files in a shared directory on a Novell, Inc. NetWare 3.12 network. "I didn't tell the networking folks about it for four months," he says with a laugh. That way, "they couldn't claim it was in any way [slowing] response time" or kill the project. When he clued them in, they had no choice but to smile and agree.

"You've got MIS saying, 'I'm not so sure [the intranet] is going to run on a Novell network. And how are you going to assign all the port addresses and all that?' " says Christopher Juliano, a marketing administration manager at Phoenixcor, Inc., a financial services firm in Norwalk, Conn. After seeing the intranet in operation, though, "they kind of found that you just hook it up and give it an IP [address], and browsers will go there and see the server."

Just as intranets can piggyback on the existing physical network, users often can create information that can be accessed on the intranet while they do their jobs. Trainers at Tyson Foods, Inc. in Springdale, Ark., have long stored class schedules in Microsoft Corp.'s Access databases. The IS group wrote Web server scripts to provide access to those databases so as trainers updated class schedules, they would automatically update their intranet content as well, says Internet administrator Donny Drummonds.

Baker takes the same approach by creating links to existing documents such as project reports and updates on regulatory issues. About half the pages on his intranet are still in their native word processing or spreadsheet formats. The others have been translated to HTML by 18 department-level webmasters with the help of easy-to-use, low-cost translation programs. With so much content created by users, Baker can do most maintenance during regular work hours.

IS managers can use the hype surrounding the Internet to encourage users to do more so the IS team has to do less. Some users volunteer to manage intranet sites after hours to learn Web skills so they'll be more marketable, says Emer Natalio, president of Network Decisions, Inc., a Miami Internet consulting and services firm. "If they don't seize the opportunity [to learn], somebody else will," he says.

Today, a lot of intranet content is easy enough for users not only to generate, but also sometimes to manage. Juliano, for example, came up through the sales support and customer service ranks, not through IS. After hearing about the Web on a radio show, "I started playing around with HTML coding," he says, and developed a prototype home page on his PC. Baker built his first home page using the rudimentary word processing capabilities of the Windows Notepad and learned HTML by looking at other HTML documents.

All this could change as intranets grow larger. Juliano can manage the 40 pages on his site without special tools but doesn't know how much his workload will grow as the intranet expands. Even if users can do the "quick and dirty" translation of documents to plain HTML, Natalio says, they haven't yet done the harder work of reformatting them for easy viewing on a computer screen. The creation and support issues will grow more complex as users begin storing and distributing audio, video and multimedia via intranets.

But at this early stage, users are the best — and maybe the only — people to create, manage and update the information posted on the intranet, Heit says. "They're the ones who understand what their needs are. You'll find that everyone, at every desk, turns out to be an author in disguise." ■

Scheier is *Computerworld*'s senior editor, management.

EDS' Rodney Baker launched an intranet without slowing down his firm's networks. He 'didn't tell the networking folks about it for months.'

you build a powerful
Web server with tens
of people download

Microsoft

Patterns of Life, Path

Computerworld and the Smit
1996 Chairmen's Committee for th
extend best wish

Launched in 1989, the Computerworld Smithsonian Awards Program salutes those who find answers with information technology.

This annual awards program, representing a spirited partnership between Computerworld and the Smithsonian Institution's National Museum of American History, brings together the user and vendor communities in public recognition of innovation and hard work.

1996 Finalists nominated by the Computerworld Smithsonian Awards Chairmen's Committee:

BUSINESS & RELATED SERVICES

Monsanto Company
Knowledge Management Architecture
Nominated by: Ernst & Young

AT&T's EasyCommerceServices
Service Fulfillment Ordering/ Provisioning System
Nominated by: Texas Instruments

BANKSYS
Electronic Purse Debit Card Payment System
Nominated by: Tandem Computers Incorporated

PCS Health Systems, Inc.
Prescription Card Services
Nominated by: Tandem Computers Incorporated

Custom Clothing Technology Corporation/Levi Strauss & Co
Personal Pair Program
Nominated by: EDS

EDUCATION & ACADEMIA

Harvard University Medical School
HP 200 LX - The Peripheral Brain
Nominated by: Hewlett-Packard Company

Carnegie Mellon University (CMU), Department of Electrical & Computer Engineering
Virtual Laboratory Experience
Nominated by: Hewlett-Packard Company

Australian Department of Immigration and Multicultural Affairs
AMEP (Adult Migrant English Program) Reporting and Management System (ARMS)
Nominated by: Andersen Consulting

UKERNA
SuperJANET
Nominated by: 3Com Corporation

NYC Public School for the Deaf
Street Signs: A City Kids Guide to American Sign Language
Nominated by: Apple Computer, Inc.

ENVIRONMENT, ENERGY & AGRICULTURE

Monsanto Company
Infielder Crops Record System
Nominated by: Intel Corporation

TIR Technologies, Inc.
Non-imaging Totally Internally Reflecting LED Lens Arrays
Nominated by: Hewlett-Packard Company

Farmland Industries, Inc.
AgInfo Geographic Information System/GPS
Nominated by: Ernst & Young

British Columbia-Ministry of Environment, Lands and Parks
Integrated Information System-Delivery of Environmental Data to the Desktop
Nominated by: Novell, Inc.

South Coast Air Quality Management District
RECLAIM Monitoring and Reporting Systems
Nominated by: Computer Associates International, Inc.

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ways of [illegible]

hsonian Institution thank the eir work in nominating entries and es to the finalists.

FINANCE, INSURANCE & REAL ESTATE

Nationwide Building Society
Interact
Nominated by: Andersen Consulting

Fannie Mae
Distressed Asset Reporting and Tracking System (DARTS)
Nominated by: NeXT Computer Inc

INTUIT, Inc.
Quicken
Nominated by: Adobe Systems, Inc.

First National Bank (FNB) South Africa Limited
Finger/Hand Print Recognition for Electronic Banking
Nominated by: Madge Network Systems

Churchill Insurance
Online Oracle-based Motor and Household Insurance (CODIS - Customer On-line Direct Insurance System)
Nominated by: Cray Research, Inc. (with Amdahl)

GOVERNMENT & NON-PROFIT ORGANIZATIONS

Mercy Ships
Crew and Donor Management System
Nominated by: Informix Software

Oklahoma Department of Human Services
Oklahoma KIDS System
Nominated by: Deloitte & Touche

SARSAT Operations Division/ National Oceanic and Atmospheric Administration
COSPAS/SARSAT
Nominated by: MCI Telecommunications Corporation

EDS
Operation ReUNite
Nominated by: America Online, Inc.

State of Wisconsin-Department of Industry, Labor and Human Relations
Wisconsin s Automated Customer Service Systems
Nominated by: Zenith Data Systems

MANUFACTURING

Northrop Grumman Military Aircraft Systems Divisions Georgia Production Site
Automated Quality Assurance for Aircraft Assemblies
Nominated by: SAS Institute, Inc.

AlliedSignal Technical Services Corporation Software Products Group
SWIM
Nominated by: Microsoft Corporation

Caterpillar, Inc.
Virtual Prototyping using the Cave Automatic Virtual Environment (CAVE)
Nominated by: Price Waterhouse

Alcan International Limited
Computer Simulated Sheet Metal Stamping
Nominated by: Cray Research, Inc.

Parametric Technology Corporation
Pro/ENGINEER Fully Associative, Feature-Based Parametric Solid Modeling Technology
Nominated by: Price Waterhouse

[illegible], ARTS & [illegible]

Pixar Animation Studios/ Walt Disney Feature Animation
"Toy Story"
Nominated by: Sybase, Inc

DIRECTV, Inc.
Direct Broadcast Satellite (DBS) Service
Nominated by: Deloitte & Touche

Magellan Systems Corporation
GPS 2000
Nominated by: Epson America

Time Warner Cable's Full Service Network
Time Warner Cable's Full Service Network
Nominated by: Silicon Graphics, Inc.

MCI Information Technology
1-800 Music Now℠
Nominated by: NeXT Computer, Inc

MEDICINE

Washington University School of Medicine
GermWatcher/GermAlert infection tracking medical expert systems
Nominated by: Sybase, Inc

Heartstream
ForeRunner Defibrillator
Nominated by: Epson America

High Techsplanations, Inc.
TELEOSR Virtual Reality Medical Simulation System
Nominated by: Silicon Graphics, Inc

National Library of Medicine
The Visible Human Project
Nominated by: America Online, Inc

Texas Department of Health (TDH)- Immunization Division
ImmTrac: A Statewide Immunization Tracking System
Nominated by: EDS

SCIENCE

Center for Light Microscope Imaging & Biotechnology
Imaging Technology
Nominated by: Eastman Kodak Company

San Diego Supercomputer Center and University of Arizona, Tucson
Electrical Turbulence in Heart Failure
Nominated by: Cray Research, Inc.

Pittsburgh Supercomputing Center/Carnegie Mellon/Massachusetts Institution of Technology
Air Pollution Modeling
Nominated by: Cray Research, Inc.

California Institute of Technology
Scalable Concurrent Programming Lab's advantage in micro-electronics, satellite manufacturing and launch vehicle design
Nominated by: Cray Research, Inc.

Los Alamos National Laboratory/Pittsburgh Supercomputing Center
3D Numerical Simulation of a Geomagnetic Field Reversal

The Computerworld Smithsonian Chairmen's Committee

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Executive Track

Clifford L. Bateman was named chief information officer at **The Dun & Bradstreet Corp.** in Murray Hill, N.J. He formerly was senior vice president of global technology at the marketing and information company.

Paula L. Simon was appointed general manager of **Metropolitan Life Insurance Co.**'s 260-employee corporatewide data center in Troy, N.Y. Simon was general manager of the company's Scranton, Pa., data center before Met Life's data center operations were consolidated at Troy. She was a re-engineering team leader before her appointment.

Leslie A. Riseberg was named vice president of technology planning at **GTE Corp.** Riseberg will be responsible for information systems at GTE's headquarters in Stamford, Conn. He will also coordinate and review the technology-related aspects of GTE business plans.

Steven A. John was named executive director of the **Society for Information Management** (SIM). He replaces Henry S. Givray. John was an IS manager at First Health Strategies and Cigna Corp. and graduated from SIM's Regional Learning Forum training program.

Ted Mandel was named managing director of marketing services and IS at **Pan American World Airways, Inc.**, a Miami-based carrier that plans to inaugurate service this summer. Mandel, a 30-year airline industry veteran, formerly was staff vice president for marketing services at Continental Airlines.

Scott Nason was named director of IS at **Precision Specialty Metals, Inc.** in Los Angeles. He formerly held the same post at Kleervu Plastics Corp.

July Conferences

MANAGEMENT

Financial Management of Data Processing (FMDP) Conference. Scottsdale, Ariz., **July 9-12** — Cost: $595 to $895. Contact: FMDP Association, San Francisco, Calif. (415) 731-3706.

Information Technology in the Enterprise: Managing IT in the Mainstream of the Business. La Jolla, Calif., **July 15-17** — Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (800) 778-1997 or (203) 316-6757. E-mail: apearce@gartner.com.

Strategic Information Systems Planning. Boston, **July 15-17** — Cost: $1,350 to $1,550. Contact: American Management Association, New York, N.Y. (800) 262-9699. E-mail: cust_serv@amanet.org.

Year 2000: Issues and Answers. San Jose, Calif., **July 16-18** — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

National Center for Database Marketing's 17th Conference and Exhibition. Chicago, **July 17-19** — Contact: Mark Kieman, Conference Programming, New York, N.Y. (212) 790-1513 or Jo-Ann Maude at Cowles Business Media, Stamford, Conn. (203) 358-9900, Ext. 712.

PC Nightmare Symposium. Orlando, Fla., **July 22-24** — Focus: PC outsourcing, procurement and asset management. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

INDUSTRIES

Cable Telephony '96: Integrating Today's Customers with Tomorrow's Technology. Chicago. **July 10-11** — Contact: ICM Conferences, Inc., Chicago, Ill. (312) 540-5698.

Healthcare Computing Conference and Expo (HCCE). Hershey, Pa., **July 14-17.**— Contact: HCCE, Chicago, Ill. (800) 913-9652 or (312) 782-5252.

Enterprise Wide Systems Integration for Utilities. Cambridge, Mass., **July 15-16** — Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400. E-mail: inq@ibcusa.com.

Telecom Billing '96—Sixth Annual Conference: Developing Billing Systems for Tomorrow's Advanced Services. Washington, **July 15-17** — Contact: Business Research Publications, Inc., Washington, D.C. (800) 822-6338 or (202) 842-3022, Ext. 317.

INTERNET

Internet for the Environmental Professional. Cambridge, Mass., **July 8-10** — Contact: IBC USA Conferences, Inc. Southboro, Mass. (508) 481-6400. E-mail: reg@ibcusa.com.

Utilizing Intranets or Internal Webs To Maximize Information Sharing in Your Organization. New York, **July 18-19** — Contact: Global Business Research Ltd., New York, N.Y. (212) 366-3212.

Web Interactive '96. New York, **July 31-Aug. 2** — Contact: Mecklermedia, Westport, Conn. (800) 632-5537. E-mail: webint@mecklermedia.com. Web address: events.iworld.com/summer96/webint.

NETWORKING

HOT HAPPENING
The 1996 Informix Worldwide User Conference and Exhibition. Chicago. **July 9-12** — Contact: Informix Software, Inc., Menlo Park, Calif. (800) 784-6580 or (617) 736-1779.

Microsoft Explorer '96 Conference and Exposition. Boston, **July 16-18** — Contact: Digital Consulting, Inc., Andover, Mass. (800) 767-2336. E-mail: ConfReg@dciexpo.com. Web address: DCIexpo.com/.

Mercury Interactive Worldwide User Conference. Lake Buena Vista, Fla., **July 21-24** — Contact: Mercury Interactive, Waltham, Mass. (800) 840-0428. Web address: www.merc-int.com.

Share Technical Conference. New Orleans, **July 28-Aug. 2** — Cost: $695 to $895. Focus: IBM. Contact: Share, Inc., Chicago, Ill. (312) 822-0932. Web address: www.share.org/.

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Network Outlook. Burlingame, Calif., **July 1-2** — Focus: Internet, network, multimedia. Contact: Technologic Partners, New York, N.Y. (212) 343-1900. E-mail: events@technologicp.com.

Best Practices in Data Warehousing. Washington, **July 8-13** — Contact: Data Warehousing Institute, Colorado Springs, Colo. (719) 599-4303. E-mail: tdwi@aol.com.

Third Annual Enterprise Desktop Developer's Conference. Lisle, Ill., **July 9-11** — Contact: Attachmate Unisys Products Group, Cincinnati, Ohio (513) 745-0500.

Object Technology in Telecommunications: The Strategic Approach to Object Orientation. Chicago, **July 15-16** — Contact: ICM Conferences, Inc. Chicago, Ill. (312) 540-3860.

11th Annual Interactive Services Association Conference and Expo. San Diego, **July 21-24** — Contact: ISA Conference and Expo Registration, Park Ridge, Ill. (847) 698-4467.

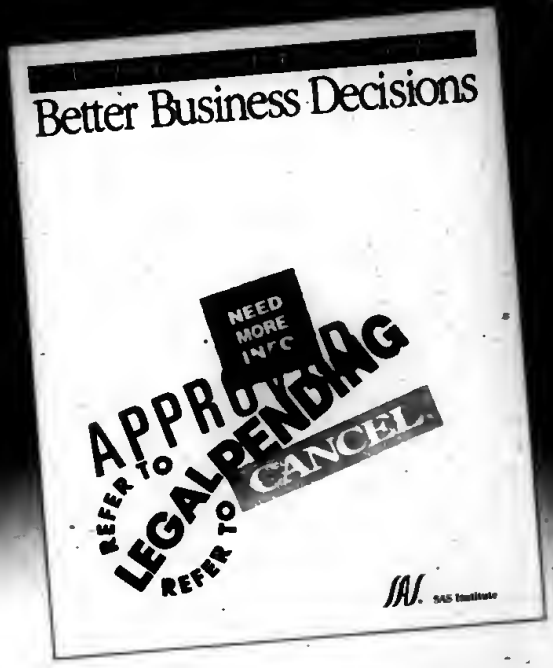
Washington Ada Symposium. McLean, Va., **July 22-25** — Contact: Ada Information Clearinghouse, Falls Church, Va. (703) 681-2466 or (800) 232-4211. Internet: adainfo@sw-eng.falls-church.va.us. Web address: sw-eng.falls-church.va.us/.

ATM Solutions: Optimizing Your Network's Performance and Service Capabilities. Chicago, **July 23-25** — Contact: Sheri Mead, ICM Conferences, Inc., Chicago, Ill. (312) 540-3859. Web address: www.icmconferences.com.

The Association for Work Process Improvement's (TAWPI) 26th Annual Forum and Exposition. San Jose, Calif., **July 28-31** — Contact: TAWPI International, Boston, Mass. (800) 998-2974.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and telephone number.

Rick Sain, Associate editor/Managing, Computerworld, 500 Old Connecticut Path, Framingham, Mass. 01701 Fax: (508) 875-8931



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Buyer's Guide

mul·ti·me·dia:

a) An agonizing madness overtaking corporate IS

b) Bitchin', bold and beautiful

c) Vendor Candyland

d) Full of holes

e) All of the above

BY CATHLEEN GAGNE

Actually, multimedia means to pass along information in more than one form: text, audio, still graphics, animated graphics and full-motion video. Why is something so seemingly straightforward wreaking havoc in the lives of users and multimedia developers?

For some reason, nobody can get their arms around this amorphous technology, including the 20 respondents to a recent *Computerworld* survey about the benefits and challenges of using multimedia, which was conducted by Market Data Group in Framingham, Mass. Note the quote from one respondent that appears beside the survey highlights below. Isn't it true that most people don't have a clue as to what multimedia really is, let alone how to deal with it?

I even came across a comment in my research that likened multimedia to teen-age love: It feels good, everyone wants it, but everyone has a different idea of what it is ... and then they wonder whether they're actually in it.

What follows in this Buyer's Guide are snapshots of some multimedia users, along with how they're grappling with challenging issues. Respondents also grade their multimedia authoring tools and often offer advice on implementation and technical issues.

Gagne is an associate editor of the Buyer's Guide.

Multimedia, *page 90*

SURVEY HIGHLIGHTS:

- **Multimedia** isn't just for training anymore.
- **Vendors aren't** delivering what users want.
  Users want compatibility between hardware and software, more user-friendly environments, products that aren't loaded with bugs, products that are complete.
  Vendors offer promises.
- **Users love** the flexibility of multimedia. It can be used for many applications throughout their companies.
- As the **Internet** and multimedia converge, bandwidth and transmission become problematic.
- **Multimedia** is expensive (surprise, surprise).
- **Multimedia** is still in its infancy, and users are frustrated.

Multimedia is most commonly used for . . .

Internal training (13)
Electronic commerce (12)
Customer information systems (11)
Professional presentations (10)
Sales presentations (9)
Education (9)
Media (7)
Citizen information (5)
News (4)

(20 users surveyed, multiple responses allowed)

Quotable

"The public's been successfully bamboozled into thinking this multimedia thing is further along than it is. I don't think most people have a clue as to what it means."

— Manager, aerospace firm

Messy as it may be, multimedia makes headway in corporate IS

Here are seven snapshots of how multimedia is being implemented. Note that respondents graded their levels using a scale of A to E, in which A equals very good, B equals good, C equals fair, D equals poor and E equals very poor.

Implementation advice

(Tips from the trenches)

Our survey respondents pass along advice and words of encouragement for peers implementing multimedia.

"Take failure. This is a really tough, frustrating and humiliating kind of undertaking."
— Manager at an aerospace firm

"Don't feel like you are the only business dabbling creating a multimedia application because there are a lot of us out there."
— Physician at a medical center

"Development is the biggest challenge. Even taking simple sound materials and integrating them into a training program takes time."
— Ron Lanhart, professor, Mohave Community College, Lake Havasu City, Ariz.

"Don't do fluff applications; do the important mission-like applications, which are critical to your core business."
— Thomas S. Loane, vice president of IS, Alamo Rent A Car, Inc., Fort Lauderdale, Fla.

"Test!"
— Adam Kalish, design director, Communication Design Center, Andersen Worldwide, Chicago

"Dedicate a resource to the technology, and give the resource plenty of time to work with it."
— Hank Hansel, network manager, Publisher's Printing Co., Shepherdsville, Ky.

"Keep your eyes open. Multimedia is still in infancy form."
— D. Alberg-Horton, logistics engineer, Honeywell, Inc., Minneapolis

"Just jump into it — that's the only way to get started, or you'll be far behind."
— Mac McDougal, audio/visual production specialist, University of Tennessee, Knoxville

"We invested a lot of dollars and learn in getting it all to work."
— Patricia Taylor, assistant vice president, technical services division, Sutton's Bank, Norfolk, Va.

[Walt Disney World]

Orlando, Fla.

WHAT'S UP:
Appearing on a terminal near you … Disney has created a building that doesn't exist. The company has designed what's being called the Boardwalk Hotel on a computer, merged it with real photography and come up with a "signature picture" of the building. This hotel has yet to be built, but it appears in brochures and other literature.

Wally Harper, manager of MultiMedia Group in Orlando, says, first they merged actual blueprints with authoring tool 3-D Studio from Autodesk, Inc. Once the hotel was created on the computer, designers chose a particular view of the building to use as their signature image. To create exact lighting for this signature image, they took a series of staged photographs. They merged the lighting details with the computer image of the hotel by doing a high-resolution scan of the photograph.

"We're doing the same technique for a brand-new resort with a Southwestern theme," Harper says. "We flew out to Arizona last week and had photographers shoot pictures outside of Tucson of cactus and the desert and so on. Then we'll put it together to introduce our signature image to the travel market."

All of this isn't fantasy; Disney just happens to be on the leading edge of multimedia. The entertainment giant uses multimedia to pair golfers for tournaments by running video projections, and interactive software drives silent auctions for charities. Other applications run across the board: training, kiosks, electronic commerce and sales presentations.

Looks real, doesn't it? Disney's Boardwalk Hotel appears in marketing brochures but is not built yet.

DEVELOPMENT TOOLS:
- Authorware from Macromedia, Inc. (B-)
- PowerPoint from Microsoft Corp. (B)
- 3-D Studio from Autodesk (B+)

WHAT'S COOL:
The flexibility. "Multimedia can be used for so many different applications. Disney has gone from six applications in one year to now roughly 24," Harper says.

WHAT'S NOT:
"The software vendors are not developing products to completion. … They develop to a certain point and then release it.

"After it's in the market, the bugs are discovered, and we find users are spending too much time resolving problems," Harper says.

WISH LIST:
- Make the hardware and software compatible for multimedia applications.
- Have vendors create a more user-friendly environment.

[Alamo Rent A Car, Inc.]

Fort Lauderdale, Fla.

Thomas Loane: Frequent renters do 90% of their transactions at kiosks

WHAT'S UP:
Alamo Rent A Car is cruising with a new self-service rental application. The multimedia kiosk runs on a PC connected to a mainframe network. Pictures of the available rental cars reside on a PC. The automated rental project allows customers to insert a credit card, find their reservation, press "go" and get a contract. The process takes 33 seconds.

But that's not all Alamo is up to. It uses customer information kiosks with an online atlas to show customers how to find their destination and what's going on in that region.

DEVELOPMENT TOOLS:
Alamo custom-developed the software after a failed attempt at using course-writing software. "We can do most of the work in Visual Basic," says Thomas Loane, Alamo's vice president of information systems.

WHAT'S COOL:
"Kiosks displace people behind the counter, but it also makes customers happier," Loane says. "While you can't quantify that, we believe it makes for more customers."

WHAT'S NOT:
"To be using an authoring system [such as a training manual authoring system or other traditional tools] and suddenly come to a point where you realize you shouldn't have gone down that path," Loane says.

[An aerospace company]

WHAT'S UP:
This firm's multimedia manager has nothing unusual to report about its use of multimedia for general presentations and training. He did offer some insight as to why multimedia still continues to be a murky area. "Early on, multimedia meant slide projectors and audio tapes and film projectors," he says. "When it got into the computer realm, it was audio of sorts and animation and pictures. … It's grown from that to something more sophisticated. But people still think you can dump home movies into the computer and edit them and set them back on tape, and that you should be able to do this just like movie houses do."

DEVELOPMENT TOOLS:
- Director from Macromedia
- MultiMedia Tool Book from Asymetrix Corp.

Overall, the manager gives his multimedia hardware and software a C. These products "don't deliver like they're supposed to. They are just beginning to work right as the machines have gotten more powerful. But it's still a dicey deal."

WISH LIST:
For vendors to resolve integration issues.

Quaker Oats Co.
Chicago

WHAT'S UP:
Quaker Oats, which says it is in full production with multimedia applications, is just one of the many surveyed sites where managers were frustrated by their budget. "We are held by timing and budgets ultimately, though we try to be as creative as possible within those limits," says Mary Pat Griswold, production specialist for audio/visual services.

Quaker Oats uses multimedia for internal training, sales presentations, kiosks, internal newsletters and electronic commerce.

DEVELOPMENT TOOLS:
- Authorware from Macromedia (A)
- PowerPoint from Microsoft (A)
- Adobe Photoshop from Adobe Systems, Inc. (B)
- Adobe Illustrator from Adobe Systems (A)
- Freehand from Macromedia (B)
- Quark XPress from Quark, Inc. (A)

WHAT'S COOL:
Being able to get higher quality information that's aesthetically pleasing and get it faster.

WHAT'S NOT:
- Too many upgrades and too much to learn at once.
- Promoting multimedia to those who don't understand the technology.

WISH LIST:
- Better storage capabilities (for example, hard drive, backup, archiving and retrieval).
- More flexibility (for example, archiving information, then being able to retrieve it and use it differently).

Andersen Worldwide
Chicago

WHAT'S UP:
Andersen is very active with multimedia, according to Adam Kallish, design director in the Communication Design Center. Here's what the company is up to:
- An interactive newsletter (see photo below)
- Promotional videos, including *Movement in the 3rd Dimension* and *Orchestrating Change*
- An interactive presentation for Andersen Consulting's Business Architecture for this year's Global Consulting Seminar.

DEVELOPMENT TOOLS:
- Director from Macromedia
- Super Card from Allegiant Technologies, Inc.
- FoxPro, Adobe Premier, Elastic Reality, Electric Image, VIDI model/Pro and Adobe Photoshop

Kallish collectively gives these tools a B for his level of satisfaction.

'Interactions,' a CD-ROM interactive newsletter, informs Andersen employees of the media work being produced within the company

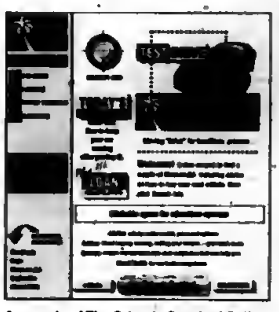
WHAT'S COOL:
Multimedia gives more sensory information vs. text-based systems that quickly become monotonous.

WHAT'S NOT:
Transmission rates. Sending things over groupware continues to be a problem with too little bandwidth.

INTERNET IMPACT:
A big issue facing Andersen is the convergence of the Internet and new media technologies. "I think it's becoming more confusing as to what new media is and how it's delivered. As the transmission becomes faster and bandwidth gets larger, you'll see new media applications right in the Web vs. over CD-ROM."

The Orlando Sentinel
Orlando, Fla.

WHAT'S UP:
Media goes multimedia? *The Orlando Sentinel*, a community newspaper, uses multimedia as a full-blown service on America Online. The paper also uses the technology to deliver television news from the newsroom — both for a broadcast partner and for Time Warner's interactive TV experiment in the Orlando market, according to Michael Bales, associate managing editor for electronic publishing.



A sample of The Orlando Sentinel Online

DEVELOPMENT TOOLS:
The paper isn't tied to any particular package. It's trying to find the package that has the most flexibility and optimal applications.

WHAT'S COOL:
- *The Orlando Sentinel Online* reaches a much larger market (national and international) than that of the traditional newspaper — a six-county region in central Florida.
- Consumers can obtain information at their convenience.

WHAT'S NOT:
Implementation can take a lot longer than you might expect.

WISH LIST:
The real future is in using "intelligent agents," which are being developed and enhanced for more effective use. Consumers still have the same problem: too little time to go through all of the information and determine what is useful to them. Intelligent agents will help consumers get what they need faster.

Nation's Bank
Norfolk, Va.

WHAT'S UP:
Nation's Bank is in full production using multimedia for training.

DEVELOPMENT TOOLS:
Authorware from Macromedia (B)

WHAT'S COOL:
The fact that users can access training modules at any time instead of waiting to attend a class or trying to schedule one, says Bobbi Hunt, an assistant vice president of the technical services division.

WHAT'S NOT:
"We are still struggling with bandwidth usage and the fact that we have such large files to deal with," Hunt says.

WISH LIST:
"Vendors need to integrate all the different graphics cards and sound blaster onto the system motherboard," says Patricia Taylor, an assistant vice president of the technical services division.

Technology/vendor issues

(Tips from the trenches)

Here's a quick look at some of the more pressing technical and vendor issues that our survey respondents face. Some offer advice and comments on problem areas.

- Look for a financially stable, supportive vendor that will be around for the long haul.
- Make sure you can provide the bandwidth your applications require.
- Look at what you want to do with the application now and then plan for the application's growth when making hardware selections.

— Patricia Taylor, Nation's Bank, Norfolk, Va.

"We need standards desperately. . . . The vendors need to stop tweaking and doing things just a little differently from one another. I am extremely frustrated. The industry is not offering platforms conducive to multimedia applications. The industry is testing capacity in spite of the fact that it's juvenile."

— Manager at a major retailer

"Make packages more flexibly priced, and make them open so they can talk to one another. It's like a broken over and over again. The technology is too high priced, and it is proprietary. The vendors need to join hands and work together, especially because of the [World Wide Web]."

— D. Alberghertan, logistics engineer, Honeywell, Inc., Minneapolis

"The amount of hardware upgrades that are required to make multimedia run is like a curve out of control."

— Adam Kallish, design director, Communication Design Center, Andersen Worldwide, Chicago

"Incompatible technology makes distribution difficult and forces authoring at lower levels of sophistication."

— Manager at a regional Bell operating company

"The vendors have poor documentation and poor technical support."

— Project coordinator at a major petroleum company

Know what you're getting into

BY KEVIN BURDEN

The greatest challenge a chief information officer can expect to face when launching a multimedia project is finding people with the right credentials, according to Al Lill, vice president and research director at Gartner Group, Inc. in Stamford, Conn.

There are plenty of capable people out there with Hollywood-type audio/video production capabilities. "They can build beautiful applications that work well the first time — but often fall apart when deployed across a corporation," Lill says. Likewise, companies are filled with information systems professionals experienced in the rigorous disciplines of application maintenance and scalability, "but they [are horrible] when developing interactivity and user interfaces," Lill says.

This discontinuity of skills is why many firms keep third-party developers so busy. Those outside firms are more likely to have a complete mix of skills than the average IS organization and are prepared to handle the responsibility of cross-platform compatibility — another critical challenge, Lill says.

The definition of cross-platform is changing quickly. "It used to mean applications could run on the Mac as well as the PC. Now it includes Windows 95, Windows NT, Unix, CD-ROM and the Web," Lill says.

Al Lill, Gartner Group: *"Unless you have a clear strategy to create a digital media asset library that can be deployed across all delivery mechanisms, you're screwed."*

The key is to create an application's content just once, then deploy it across CD-ROM, video servers, delivery platforms and the Internet. "Unless you have a clear strategy to create a digital media asset library that can be deployed across all delivery mechanisms, you're screwed," Lill says. The consequences are applications that are limited to their platform, applications that must be retooled to expand their use and a lot more work.

More firms may experience these challenges firsthand as multimedia authoring tools become more robust under collapsing prices. "Instead of paying a quarter [of a million dollars] to half a million to an outside developer, it will become very cheap in the near future to build applications in-house," Lill says.

Whether projects succeed depends on how fast both ends of the skills continuum converge. "Right now, the biggest problem is trying to pick the best talent from both worlds," says Lill, referring to the Hollywood types vs. corporate IS staff. But when the tools become so cheap that anyone willing to spend the time can create an application, the bigger problem will be weeding through the "very many, very bad multimedia applications," he says. ■

Burden is *Computerworld*'s senior researcher, Scorecard/Firing Line.

SAMPLING OF POPULAR AUTHORING TOOLS

Why these products? Analysts identified most tools in this sampling as being among those most widely used. Other products in this chart were those most commonly cited as the "primary" authoring tool of developers surveyed by *Computerworld*. The analysts, Joan Carol Brigham at International Data Corp. in Frisco, Colo., and Al Lill at Gartner Group, Inc. in Stamford, Conn., also offered comments on product strengths and weaknesses. (Products are listed in alphabetical order.)

PRODUCT/COMPANY	WEB ADDRESS	PRICE	STRENGTHS	WEAKNESSES
Astound 2.0 Gold Disk, Inc. Santa Clara, Calif. (408) 982-0200	www.goldisk.com	$250	Easy-to-use, template-driven interface. An outstanding value at $250. Bundled with Astound Studio, a suite of full-featured tools for creating, editing and managing multimedia applications.	Constrained to presentations, little design guidance, no online tutorial or help.
Authorware 3.5 Macromedia, Inc. San Francisco (415) 252-2000	www.macromedia.com	$4,995*	Specializes in interactive information. "Flowline" metaphor groups icons into a single-screen map, making complex applications easier to understand. Application contents can be optimized for intranets with Shockwave for Authorware.	Lacks a scripting language.
Director 5.0 Macromedia, Inc. San Francisco (415) 252-2000	www.macromedia.com	$850	"Score" metaphor develops precisely timed applications. Its language, Lingo, uses English phrases. Applications are compatible across Windows and Macintosh. Applications can be embedded into Web pages using Macromedia's Shockwave.	Lacks an overview screen that shows the application's flow. Navigating through the score becomes difficult as it grows.
IconAuthor 7.0 AimTech Corp. Nashua, N.H. (603) 883-0220	www.aimtech.com	$4,995*	Uses an easy-to-follow icon-based flowchart metaphor that shows the sequence of the entire program. Strong ODBC support. Its applications can run on the Internet. It has a version specific to computer-based training (CBT Express, $1,495).	Its price. Navigational paths are created with traditional branching structure instead of "GO TO" commands.
Multimedia Toolbook 4.0 Asymetrix Corp. Bellevue, Wash. (206) 462-0501	www.asymetrix.com	$895	Easy-to-understand "book" metaphor comprised of pages. Very flexible and as broad-based as Macromedia Director. AutoScript library lightens the programming load. CBT version available (Multimedia Toolbook CBT, $1,249).	Lacks a flowchart of the overall program. It's OpenScript programming language isn't for beginners. No Macintosh version.
PowerPoint for Windows 95 Microsoft Corp. Redmond, Wash. (206) 882-8080	www.microsoft.com	$399	Well-integrated with Microsoft Office applications. Template-driven interface is easy to learn. Strong drawing and graphic tools. Presentations can be exported to the Internet with new HTML add-in. Affordable price.	Lacks media players for previewing audio. Relies heavily on applications such as Microsoft Word and Excel for tasks, including table creation.
Visualage for Smalltalk IBM Armonk, N.Y. (914) 765-1900	www.ibm.com	$1,499 to $3,799*	Strong multiplatform support. Consistent interface across versions. Drag-and-drop workspace for GUI development. Strong set of prebuilt components for assembling portable applications.	Requires over 190M bytes of hard disk.

*High-end tool intended for corporatewide applications

1996 Computerworld Smithsonian Awards

Put technology in people's hands and get out of the way. What happens? Miracles. Every year, the Computerworld Smithsonian Awards Program honors technological innovation that benefits society. All 50 of the 1996 finalists are listed on these pages. We've taken a look at six this week. See our June 10 issue for the winners.

MEDIA, ARTS & ENTERTAINMENT

Magellan Systems Corp.

Hikers, hunters, backwoods campers and boaters all eventually ask the same question: "Where in the world am I?"

Magellan Systems Corp. has made it possible for anyone on the planet to know where they are — down to degrees, minutes and hundredths of minutes — with the GPS 2000, a personal location device.

The 10-ounce, handheld GPS 2000 is, at its core, a radio receiver that uses the U.S. Department of Defense's Global Positioning System (GPS) of 24 globe-orbiting satellites to pinpoint user locations. The $200 device runs on four AA batteries and is tuned to the spread-band frequency used by the satellites. It can remember up to 100 locations and plot a route between two end points, with up to 29 points in between.

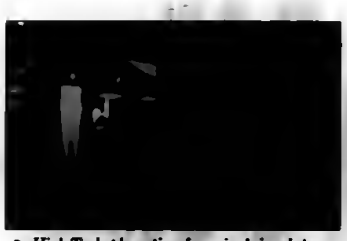
GPS 2000 was recently used in the World Series of Birding to pinpoint raptor nesting sites and species locations. It helped drivers in the 1995 Paris/Dakar Rally find the shortest way across unmapped desert. Hunters use GPS 2000 to mark bedding areas and feeding grounds as well as to point the way back to the truck after a long day in the woods.

With a topographical map and the GPS 2000, hikers can plan backcountry trips by programming a route complete with trailheads and landmarks. On the trail, they can use the tool to guide them back on course if they get off track. When set in "sampling" mode, it turns itself on and compiles a log all day, recording its location every 10 minutes.

There's a standard joke about a dim-witted fisherman marking a great fishing spot by drawing an X on the side of the boat. Now, fishers can enter their secret spot into GPS 2000's memory, return to that exact location and reel 'em in.

— By Stewart Deck, staff writer

Magellan Systems' personal locator, which runs on batteries, uses Global Positioning System signals to tell users where they stand — literally



High Techsplanations' surgical simulator makes training riskfree for doctors and medics

Using the device, the trainee actually feels a 'pop' as the needle penetrates virtual skin

MEDICINE

High Techsplanations, Inc.

Several thousand goats would like to sincerely thank High Techsplanations, Inc., the Rockville, Md., developer of Teleos, a medical simulation software program.

Goats are routinely anesthetized and wounded by gunfire in order to train U.S. Army medics to treat battlefield injuries. But computerized simulations are beginning to let doctors and medical personnel practice complex procedures without putting scalpel to flesh — human or animal.

Martin McGurn, High Techsplanations' director of business development, says the company developed surgical simulations along the lines of flight simulators. "We needed to travel through an anatomical environment like a plane flies through an atmospheric environment," McGurn says, "but our tools needed to interact with organic structures."

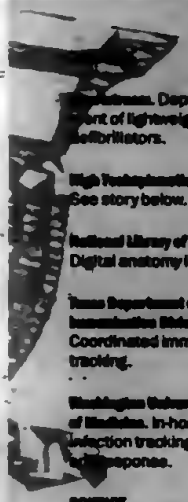
Gerald Higgins, the company's director of biomedical visualization, says, "Once we had three-dimensional organs that would move and bleed in a virtual environment, two more phenomena were needed. One is collision detection, so that when you hit the liver, the liver … deforms accordingly. The second was haptic feedback, a tactile perception of what's happening on the screen — feeling a pop as a hypodermic needle penetrates skin."

One anticipated result of these simulations is automatic tracking and evaluation of physicians as they're trained. This would let institutions award certification or grant hospital privileges according to skill, without putting patients at risk.

Duke University and Pennsylvania State University are among those using the technology. Harvard Medical School and Massachusetts General Hospital are working on outcomes measures, and medical associations have offered Teleos-based learning in continuing medical education seminars. In addition, the Advanced Research Projects Agency of the U.S. Department of Defense is working on simulated kidney damage to train medics. It sure beats shooting goats.

— By Kay Carstens, a freelance writer in Maynard, Mass.

1996 Computerworld Smithsonian Awards Finalists



[illegible]. Deployment of lightweight defibrillators.

High Techsplanations, Inc. See story below.

National Library of Medicine. Digital anatomy library.

Texas Department of Health, Immunization Division. Coordinated immunization tracking.

Washington University School of Medicine. In-hospital infection tracking and response.

SCIENCE

California Institute of Technology. Satellite launch vehicle simulation.

Center for Light Microscope Imaging and Biotechnology. Acquisition of data on chemical dynamics of living cells.

Los Alamos National Laboratory/Pittsburgh Supercomputing Center. 3D simulation of earth's magnetic field.

Pittsburgh Supercomputing Center/Carnegie Mellon/EMC. Necessity of nitrogen oxide control in smog abatement.

San Diego Supercomputer Center and University of Arizona, Tucson. See story, page 96.

TRANSPORTATION

CAE Electronics Ltd. Flight simulation for emergency training.

General Motors Corp. Integration of car phone, global positioning and car electronics.

Massachusetts Transit Authority Bridges and Tunnels. Automated toll collection.

Southwest Airlines. See story, page 98.

Valujet Airlines. Ticketless air travel.

Continued on page 96

THIS IS A MIDRANGE SERVER.

The AlphaServer

JUST LIKE THIS IS A MIDSIZE CAR.

Here's where you forget your old notions about "midrange" computing. Digital's new AlphaServer™ 4100 system isn't middling in any way. It's the only server in the category that's fully 64-bit, that has VLM64™ (very large memory). Which means it can **WHATEVER YOU NEED MANY TIMES MORE ROOM TO GROW.** *run your applications many times faster, so you won't just be doing old jobs quicker, you'll do new things. And it runs Windows NT,™ Digital UNIX® and OpenVMS,™ so your choice of applications is huge, plus its modular design gives you plenty of room to grow. Yet price/performance are way below what you'd expect. See? Performance is higher, cost is lower, it's not in the middle of anything. For more, call a Digital Business Partner, call us at 1-800-DIGITAL (press 4) or visit our Web site at http://www.digital.com/info/alphaserver.*

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WHATEVER IT TAKES℠

ACG

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1996 Computerworld Smithsonian Awards

BUSINESS & RELATED SERVICES

AT&T Corp. Electronic commerce network.

Banksys. Debit card.

Custom Clothing Corp./Levi Strauss & Co. See story at right.

Minnesota Co. Data warehouses.

PCS Health Systems, Inc. Online prescription record-keeping.

EDUCATION & ACADEMIA

Australian Department of Immigration and Ethnic Affairs. Coordination of migrant and refugee programs.

Carnegie Mellon University, Department of Electrical and Computer. Remote lab access.

Harvard University Medical School. Palmtop computers for medical students.

NYC Public School for the Deaf. See story, page 98.

Ulama. Multimedia network for more than 90 universities and labs.

ENVIRONMENT, ENERGY & AGRICULTURE

British Columbia Ministry of Environment, Lands and Parks. Consolidation of all biological, spatial and attribute data.

Farmland Industries, Inc. Global positioning system to track crop productivity.

Minnesota Co. Crop data gathering.

South Coast Air Quality Management District. Pollution monitoring system.

TIR Technologies, Inc. Mirror-enhanced LEDs.

GOVERNMENT & NONPROFITS

Oklahoma Department of Human Services. Monitoring of child abuse and neglect.

Electronic Data Systems Corp. Reunification of families separated in former Yugoslavia.

Continued on page 98

BUSINESS & RELATED SERVICES

Custom Clothing Technology Corp./Levi Strauss & Co.

Every woman knows the terror of shopping for jeans. You try on hundreds of pairs, but they're all too short, too tight, too long, too loose, the wrong color.... There has never been the perfect pair of jeans — until now.

Last October, Levi Strauss & Co. bought Custom Clothing Technology Corp., which developed the Personal Pair Program, a system for custom-made women's jeans.

A woman can now walk in to one of 50 Levi store locations that has the Personal Pair Program, decide which color and style she wants and get measured by a store clerk. Three weeks later, she has a pair of Levi jeans made especially for her.

The clerk enters the information into a 486- or Pentium-based machine through a proprietary touch screen. That information goes into a Lotus Development Corp. Notes file and is sent via AT&T Network Notes to the factory in Mountain City, Tenn.

Orders are collected at the factory each night. The jeans are barcoded so they can be tracked through the factory and sent to the correct customer — all for $65 per pair.

The biggest challenge in developing this system was making it very simple to use. "Store people are good at selling clothes, and we don't want to let technology get in the way of them doing their job," says Bethe Palmer, director of retail operations.

This focus on user-friendliness succeeded. "It's easier to use the computer than it is to do the actual measuring," says Amy Sniffen, a clerk at the Natick, Mass., store.

But what about men who share the terror of shopping for jeans? According to Levi, they can expect this technology to be around their waists in the next year.

— By Stefanie McCann, senior graphics coordinator

A clerk measures a shopper for custom blue jeans as part of the Personal Pair Program

SCIENCE

San Diego Supercomputer Center and University of Arizona, Tucson

One of every three American men who dies between the ages of 20 and 64 succumbs to sudden cardiac death. For many, there are no warnings or prior symptoms, and autopsies reveal no evidence of what went wrong.

The immediate cause is usually an electrical phenomenon called fibrillation. This rapid, irregular fluttering of heart muscle can halt circulation and cause brain death within minutes. If fibrillation were better understood, it could perhaps be forestalled. In addition, more effective techniques could be developed for defibrillation, which currently relies on massive electrical shocks to restore the normal heartbeat.

In the early 1980s, A. T. Winfree, a professor at the University of Arizona in Tucson, theorized that a phenomenon known as "rotors" might be the cause of fibrillation.

Rotors — tiny electrochemical whirlwinds — might disrupt the smooth electrical waves that control the heartbeat.

Winfree headed a drive to determine whether rotor theory agreed with the electrical behavior of heart muscle. By 1990, a series of experiments at the San Diego Supercomputer Center established such agreement.

Now Winfree uses the center's Cray Research, Inc. 90 supercomputer to model how rotors behave in heart muscle. Such modeling supplements real-world experimentation, which is hampered by the difficulty of placing electrical probes evenly throughout a heart.

Winfree divides a cube of simulated heart muscle into 10 million cells. Then, for each cell, thousands of times per second, the Cray solves a differential equation that models the transfer of electrical charges across cell membranes. The results reveal how rotors disorganize the heartbeat.

The computations involved aren't particularly difficult, Winfree says, but they are so numerous and involve so many numbers that a supercomputer is ideal.

In this technical world, filled with phrases such as "phase singularity" and "action potentials," Winfree says it's important not to forget the ultimate goal: saving lives. "We still don't know what causes fibrillation," he says. "Until we do, we can't control it."

— By Dan Richman, senior editor, databases

A. T. Winfree numerically solved differential equations to check the quantitative consistency of some fibrillation theories

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31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D, Tech. Mgmt.
50. Sys. Integrators/VARs/Consulting Mgmt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Assistant VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Marketing Mgmt.
70. Medical, Legal, Accounting Mgmt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Dev. Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries?
(Select only one per column.)

	1. At this location	2. Entire Organization
A. 20,000 +	❑	❑
B. 10,000 – 19,999	❑	❑
C. 5,000 – 9,999	❑	❑
D. 1,000 – 4,999	❑	❑
E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
J. 10 – 19	❑	❑
K. 1 – 9	❑	❑

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70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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23. Dir./Mgr. Sys. Development, Systems Architecture
31. Programming Mgmt., Software Developers
41. Engineering, Scientific, R&D, Tech. Mgmt.
50. Sys. Integrators/VARs/Consulting Mgmt.

CORPORATE MANAGEMENT
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E. 500 – 999	❑	❑
F. 100 – 499	❑	❑
G. 50 – 99	❑	❑
H. 20 – 49	❑	❑
J. 10 – 19	❑	❑
K. 1 – 9	❑	❑

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Sensor Operations Division, National Oceanic and Atmospheric Administration. Global satellite network.

Wisconsin Department of Industry, Labor and Human Relations. Job-matching system.

MANUFACTURING

Alcoa International Ltd. Aluminum-stamping simulation training tools.

AlliedSignal Technical Services Corp., Software Products Group. Distributed product management

Caterpillar, Inc. Virtual-reality design tools.

Northrop Grumman Military Aircraft Systems Division, Georgia Production Site. Automated quality assurance.

Parametric Technology Corp. Computer-aided design.

MEDIA, ARTS & ENTERTAINMENT

DirecTV, Inc. Small-dish satellite TV delivery.

Magellan Systems Corp. See story, page 93.

MCI Information Technology. Music shopping over the telephone.

Pixar Animation Studios/Walt Disney Feature Animation. Computer animation in the movie *Toy Story*.

Time Warner Cable's Full Service Network. Integration of cable, computer and telephone networks.

FINANCE, INSURANCE & REAL ESTATE

Churchill Insurance. Real-time risk analysis that speeds price quotes.

Federal National Mortgage Association. Tracking system that reduces defaults.

First National Bank, South Africa Ltd. Fingerprint recognition technology.

Intuit, Inc. Quicken personal finance software.

Nationwide Building Society. Multimedia sales kiosks.

TRANSPORTATION
Southwest Airlines

You stride past the "Passengers with tickets only" sign and pat your breast pocket and ... it's unnervingly soft. You put down your briefcase and check all your pockets. Then the outside flap on your bag. Maybe it's at the rental car counter? The newsstand? Oh, look at the line at the X-ray counter *now*. It must be in here somewhere....

If you fly Southwest, you can make sure this doesn't happen again.

Southwest Airlines is among the carriers that let you book your reservation and just show up at the airport with identification. Southwest offers this ticketless travel to all passengers with credit cards, and about 35% of all passengers use it (16 million people to date).

And for the airline, it means more than customer convenience — it means savings of $25 million per year.

Southwest got the system up in four months — it was easily an 18-month project, says controller Bill Lyons — after it was bumped from several reservations systems run by other carriers in 1994.

The mandate was to develop flexible electronic records that would let passengers change their itinerary and update those changes systemwide for boarding, billing and other departments.

A team of 40 had from May until Labor Day 1994 to figure out how to link reservation systems, an HP 3000, Videcom airport terminals and other hardware.

"We were approaching a deadline at one point, and [we thought], 'Well, we have one week, but that's actually three weeks when you consider there's 24 hours in a day,'" says Lyons, who headed the project.

Now airport agents key in the first few letters of a passenger's last name and scroll down for a match. Error rates are less than 1%, and planes are still boarded in about 15 minutes.

— By Anne McCrory, managing editor for special projects

A traveler finds that even with Southwest Airlines' ticketless travel, you can check your bags curbside

EDUCATION & ACADEMIA
New York City Public School for the Deaf

"Don't bug me!" "Cool, man!" "What's the idea?"

Everyday talk for most 14-year-olds, but foreign expressions to deaf kids. It's hard enough to convey ordinary concepts to deaf children, let alone the sarcasm and superlatives of teens' language. But a CD-ROM, called "StreetSigns: A City Kid's Guide to American Sign Language," helps both deaf and hearing students grasp these and other complex concepts. The CD-ROM was produced at JHS 47, a school for the deaf in inner-city New York.

With its ability to show action, facial expression and emotion, the CD-ROM is a superior way to teach American Sign, which is a language of concepts, not words. With the sign-movies, deaf kids can learn that "Cool, man," for example, expresses approval — rather than indicating the ambient temperature.

Students use the graphical interface to choose a learning destination — City Hall, the corner store or Wall Street

Though developed for deaf students, the StreetSigns CD-ROM is also used to teach complex concepts to hearing kids

The CD-ROM contains more than 650 sign-movies divided into 24 language categories. On computers, students roam the streets of New York, learning number and money concepts on a virtual Wall Street and traveling to Central Park to learn signs for nature concepts, to the United Nations to learn signs about different countries and to a virtual St. Mark's Place in Greenwich Village, where hipsters and punk rockers hang out, to learn street language. When they click on a word, the signer-actors who appear on-screen are their fellow students. That lends credibility and immediacy that line drawings can't imitate. Best of all, the movies can be exported into student reports, databases and slide shows.

Seven students served as signers, and four designed the street layouts with the help of Susan Abdulezer, a teacher of deaf students and multimedia coordinator for special education in the New York City public schools. Many of the tools used to build the CD-ROM were obtained through a grant from Apple Computer, Inc.

— By Kay Carstens, a freelance writer in Maynard, Mass.

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SUMMER

All predictions were for a boom year for certain IS jobs and skills

By Daniel Lyons

It's hotter than hell when it comes to job opportunities this summer for information systems professionals.

The continued corporate migration from legacy systems to client/server provides a booming market for IS professionals. All predictions of a banner year are holding strong. And IS pros with expertise in areas such as object-oriented programming and database administration are in high demand.

"We are significantly increasing the amount of development that we do in client/server environments," says Jerrold Grochow, chief technology officer at American Management Systems, Inc. in Fairfax, Va. "We're also doing more with object technology and now also in Web technology. Those are the skills that we're most looking for. Finding people who are experts in those technologies is particularly difficult."

IS managers agree the demand will continue to rise for client/server specialists — and so will salaries.

"People who have client/server skills and who know how to use client/server tools are worth a premium of about 20% over standard Cobol programmers," says Len Tenner, chief information officer at Hewitt Associates in Lincolnshire, Ill. Hewitt has largely moved its computing platforms to client/server.

So which skills are this year's candidates for the hottest salaries and job prospects? Here's a look at those that are smokin' at the midway mark.

LANGUAGES

Making Smalltalk

Object-oriented languages are still the rage, and the one on most employers' lips is Smalltalk.

"Smalltalk is the language we're primarily looking for today," Tenner says. He says skilled object programmers can command a premium of 20% to 40% over the salary of a standard Cobol programmer, which is approximately $40,000 to $50,000.

Tenner's organization standardized on Smalltalk in 1989. He doesn't insist that all job applicants know Smalltalk, but he wants them to understand object-oriented programming.

"We're really just looking for people who understand the object paradigm, who have made the shift from classic programming to objects," Tenner says. "After that, knowledge of a particular language becomes secondary."

The other hot language is C++, which has more mainstream appeal than Smalltalk.

"I'd say that C++ and Visual Basic are among the hottest skills that we're looking for now," says Gerry Nash, director of human resources at Cincinnati Bell Information Systems (CBIS) in Cincinnati.

But Nash says CBIS doesn't pay a premium for developers with such skills. "We've not found that to be the case," he says.

"There is huge demand for people with client/server and object-oriented development experience, and some organizations might pay more to get those people in the door," Nash says. "But if you look at an overall picture, those people are really getting paid about the same as other people whose background is in legacy systems."

TOOLS

Power Tools

The "killer" tool to bring to the IS job site these days is PowerBuilder from Powersoft.

Companies are in hot competition for professionals skilled in Powersoft Corp.'s PowerBuilder. The next greatest demand is for IS talent skilled in Microsoft Corp.'s Visual Basic.

But which skill you possess can translate into very different job and salary offers. The reason: There are far more programmers available in the market with Visual Basic skills.

"Usually we can get Visual Basic people at cheaper rates than other people, such as people who have PowerBuilder skills," says Glenn Chafe, systems manager in advanced technology at Canadian National Railways in Montreal.

Meanwhile, Visual Basic is losing cachet at some organizations. Bryan McNeely, vice president in the Strategic Technology Group at NationsBanc Services, Inc., a division of NationsBank Corp., in Charlotte, N.C., says his organization hires a lot of Visual Basic programmers but is moving away from the product.

"Probably more than anything right now we're still using Visual Basic," McNeely says. "But we'd like to get away from Visual Basic. We think it should be used as a tactical solution but not for regular strategic development. For those projects, we're trying to move toward Delphi [from Borland International, Inc.] or Visual C++ or the new PowerBuilder."

Other hot tools include Gupta Corp.'s SQL Windows, a client/server database development tool, Tenner said. He says his company recruits developers with experience in SQLWindows and in IBM's object-oriented development tools.

"People who have client/server skills and who know how to use client/servers tools are worth a premium of about 20% over standard Cobol programmers."

– Len Tenner, CIO, Hewitt Associates

"Today, Windows NT skills are the key to future riches. Those people are going for $145 an hour and up."

– Roj Snellman, senior manager, Harris Semiconductor

SIZZLERS

At the midway mark, here are the skills topping the charts

SYSTEMS

A certification in Windows NT can be a sure ticket to fame and fortune.

Systems engineers who have mastered Microsoft Corp.'s Windows NT can put their careers on the fast track to success, says Roj Snellman. The combinatioo of high demand and talent shortage is forcing Snellman to contract for the skill at his IS shop. And he pays dearly to do so.

"Today those skills are the key to future riches. Those people are going for $145 an hour and up," says Snellman, senior manager in the systems architecture group at Harris Semiconductor, a division of Harris Corp., an electronics, telecommunications and semiconductor manufacturer based in Melbourne, Fla.

That $145-per-hour rate, Snellman points out, is what IS shops pay consulting firms for certified systems engineers (CSE). A typical salary for a CSE would be $40,000 to $50,000, he says.

"One of the hottest careers right now is for NT Advanced Server administrators," says Keith Herron, manager of microcomputing at Weil, Gotshal, and Manges, a law firm in New York. "Also there is a lot of demand for SQL Server database administrators."

Herron's belief is borne out by Larry Blevins, senior vice president of information technology at Harris Methodist Health System, a health-care provider in Fort Worth, Texas.

Harris has approximately 200 SQL Server database servers running on top of Windows NT Advanced Server. In the next year or so, the company will migrate its users to Windows NT as well, Blevins says.

APPLICATIONS

Data warehousing and client/server are creating huge demand for database experts.

At NationsBanc Services, Inc., having some experience with database technology will get you a quick invitation to meet with the boss.

"We're going after a lot of database technology people," McNeely says. "We're doing a lot of reengineering of applications as we move off mainframes and into the client/server world. So we need a lot more database expertise than we have in the past."

Notes, from Lotus Development Corp. in Cambridge, Mass., is another hot specialization, Chafe says. He says the demand for Notes experts exceeds supply. Consequently, "Notes developers are very expensive," he says.

Skilled Notes programmers earn a 20% to 30% premium at Hewitt Associates. But the bigger paychecks are going to IS professionals skilled in the latest version of Notes, Version 4.0, which was released this year.

The differences between Notes 4.0 and 3.0 are significant, and those who don't have the latest certification should plan to head back to the classroom. But don't worry, the investment will be well worth it in the long run.

Other hot application areas, Tenner says, include PeopleSoft, Inc. software and client/server databases such as those from Oracle Corp. "Skilled database administrators are really in demand," Tenner says.

JOBS

The greatest job need is for IS professionals who can resolve the year 2000 problem.

Legacy systems skills generally are considered the least profitable — with one exception. Mainstream skills such as Cobol and CICS are fairly easy to find, but there is a high demand for and short supply of people who can tackle projects that involve making legacy programs year-2000 compliant, says Steve Mitchell, a project officer at Canadian National Railways (CNR). Mitchell works with legacy systems.

Many companies — CNR among them — have thousands of programs that need to be augmented to accommodate dates past 2000. There are tools available, but they aren't easy to use. For many companies, it will be easier to hire a consultant than to undertake the task in-house.

"What seemed like a low urgency project two or three years ago now is starting to get more urgent," Mitchell says. "There are a lot of consultants making a lot of money on this. They're really in demand, and they're going to become more in demand as people realize that they don't have the staff to handle this, and they start to panic. The prices are going to go up."

Demand is beginning to swell for consultants who can manage year-2000 conversion products, according to officials at Cogni-CASE, Inc. in Montreal. Cogni-CASE sells a product called Cogni-2000 that helps companies convert their code.

"There is going to be a real shortage of resources in 1998 and 1999," says Jean Allen, vice president of Cogni-CASE. "There won't be enough people to do the work. Most companies are way behind on this." ■

Lyons is a freelance writer in Ann Arbor, Mich.

Regional Scope: Colorado

Heads *in the* CLOUDS

The Rocky Mountains continue to lure IS professionals to Colorado. Fortunately, more jobs are now available.

By ALAN RADDING

If you're tantalized by ski ads — the ones in which skiers swoosh down snow-filled bowls in bright sunshine high above the Rocky Mountain tree line — then Colorado should be the next stop on your career path. The Rockies loom over back yards in cities such as Denver and Colorado Springs, where more IS jobs are available than ever before, and the salaries are rising.

"In the 20 years I've been in business here, the market is stronger than I've ever seen," says Stephen Kukoy, CEO of Abacus Consultants, Inc., s consultancy and technical/executive search firm in Denver.

More than 2,000 businesses reported hiring IS people in 1994, the last year for which the state has figures. That represents an increase of 25% from 1992.

An Internet search of several Usenet groups — co.jobs, misc.jobs. offered and alt.computer.consult — turned up almost 500 programming jobs in Colorado.

Driving the demand is the emergence of Colorado ss s mini-Silicon Valley. The state's job growth is coming from small start-up software and hardware firms, weighted heavily toward storage technology and wide-ranging telecommunications/cable television companies.

The increase in jobs also is paying off in salaries. The average IS salary has grown from about $44,000 to about $47,000, said David Chapman, a statistical analyst at the state's Labor Market Information Unit. Ironically, the growing demand for IS professionals and rising salaries has created problems for the Department of Labor and Employment, which wants to hire IS people, too.

"The toughest thing is getting the level of skills we need when the private sector pays more," says Harvey Nakayama, application development manager. The departmeot is moving to s client/server setup and is seeking IS professionals who are skilled in Software AG of North America, Inc.'s Adabase and Natural programming languages, Fowersoft Corp.'s PowerBuilder and databases from Oracle Corp., Informix Software, Inc. and Sybase, Inc.

Photo courtesy of the Colorado Springs Visitors Bureau

Colorado IS pros *don't have to look far for scenic backdrops such as this*

The private sector is chasing many of the same skills, specifically Unix, Oracle, Sybase and Informix, says Tom Call, Denver manager of Hall Kinion, a high-tech recruiting company. "An Oracle developer with three to five years' experience can get $60,000 or more," Call says.

The largest IS employers in the area include cable TV companies Tele-Communications, Inc. and Time Warner Inc., and US West Communications, Inc., AT&T Corp., Hewlett-Packard Co. and IBM.

US West, the regional Bell operating company, recently posted a wide range of Colorado job openings on the Internet.

The positions included programmer/analysts experienced with IBM mainframes and the MVS operating system, Information Builders, Inc.'s Focus language, SQL, Cobol and SAS Institute, Inc.'s client/server applications; Oracle database administrators; and wireless software engineers with C/C++, Unix and telecommunications experience.

For an IS professional with a technical bent and s desire to work in the computer or telecommunications industry, Colorado has much to offer.

"I had heard Colorado had s very high quality of life," says James Skaife, who arrived from Utah as s newly hired software development engineer st ConferTech International, Inc. in Westminster. He says he hasn't been disappointed.

The outdoors drives the lifestyle of the region's IS pros. They point to dance companies, symphony orchestras and art museums as indicators of Colorado's growing sophistication. But it's skiing, hiking and the mountains that draw most of the sttention. "Colorado is real sports- and outdoors-oriented, and we like to ski," Skaife says. ■

Radding is a freelance writer in Newton, Mass.

DENVER/BOULDER

WHAT'S THE STORY HERE?
- The major employment market in Colorado
- Denver is the state capital and a regional center
- Sizable state and federal IS operations are based here

WHO'S GOT THE MOST JOBS?
Tele-Communications, Inc.
US West Communications, Inc.
EDS
First Data Resources Corp.
IBM

WHAT SKILLS WILL I NEED?
Client/server technologies
All popular relational databases
Object technology
Data warehousing

WHAT CAN I EARN?
C/C++ programmers with three years experience can expect $48,000-$60,000.

WHAT'S THERE TO DO?
- Football (Broncos), basketball (Nuggets), hockey (Avalanche) and baseball (Rockies)
- A museum uf natural history, art museum and zoo
- Live theater and dance
- Thriving restaurant scene

The Rocky Mountains are everyone's backyard in Denver

COLORADO SPRINGS

WHAT'S THIS PLACE ABOUT?
About 50 miles south of Denver

WHAT'S THE STORY HERE?
- Distinctly nonurban atmosphere
- Second-largest city in the state
- Plenty of local and county government IS opportunities
- Small community of military and space technology

WHO'S GOT THE MOST JOBS?
MCI Communications Corp.
Digital Equipment Corp.
FedEx Corp.

WHAT SKILLS WILL I NEED?
Internet
Unix
C programming
C++ programming

WHAT CAN I EARN?
- Salaries run a bit lower than in Denver
- High demand for IS project consultants

WHAT ARE THE ATTRACTIONS?
The scenery, especially Pikes Peak
U.S. Olympic Training Center
U.S. Air Force Academy

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The individual in this position must have one or more years of programming experience working in C or C++ on programs that interface to SQL databases in a UNIX environment. Experience with Oracle Pro*C is a strong plus. Must have experience in UNIX shell programming. BS or MS in CS. **Response Code: CPG/KC/603.**

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The individual in this position will develop Microsoft Access applications. The person should have two or more years programming experience working with MS Access and Visual Basic on programs that interface to SQL databases in an ODBC environment. Experience with Oracle SQL a strong plus. BS or MS in CS, MIS or Business. **Response Code: MSAD/KC/603.**

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The individual in this position will design, develop, and maintain data standards and data dictionary for Symbios Logic's mission critical databases. The person will interface with users, developers and database administrators. The person will also work with functional groups to develop consistent data management practices and improve data integrity. Past experience in business systems consulting and supervision of database administrators strong plus. BS or MS in CS, MIS or Business. **Response Code: DA/KC/603.**

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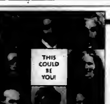

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PROGRAMMER ANALYSTS. Design, develop, test and document mainframe applications in the airline industry using UNISYS TIP environment and FORTRAN. Evaluate user requirements for new or modified applications. Develop and implement an efficient migration plan for the new software system utilizing client server capabilities. Requires B.S. in Computer Science and 2 years experience using mainframes and FORTRAN, six months of which must be in the use of UNISYS TIP environment in the airline industry. 8 day, 37.5 hr/wk, $40K+/yr depending on experience. Please respond with resume to Georgia Department of Labor, Job Order # GA 5975212, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest Department of Labor Field Service Office.

Database Administrator - majority of time at client sites in Boston metro area, balance elsewhere. Install Oracle databases as per OFA specs; set up connectivity of clients to servers, maintain databases & ensure integrity of data & back up/recovery procedures. Utilize Oracle 7.0, PL/SQL 2.0, SQL Forms 4.5, SQL Report 2.5, SQL NET 2.0 & ODBC 1.1. Bachelors/Comp Sci or Engg or Math, 2yrs/exp. in job offered. Exp. in job offered must incl 1 yr using Oracle 7.0, PL/SQL 2.0, SQL Forms 4.5, SQL Report 2.5, SQL NET 2.0 & ODBC 1.1. 40hrs/wk (9-5 M-F) $48,000/yr. Send resume in dupl to Case #60008, PO Box #8868, Boston, MA 02114.

PROGRAMMER ANALYSTS. Design, develop, test and document mainframe applications in the airline industry using UNISYS and FORTRAN. Evaluate user requirements for new or modified applications. Develop and implement an efficient migration plan for the new software system utilizing client server capabilities. Requires 2 years experience in a mainframe environment as a Systems Analyst, one year of which must be using UNISYS and FORTRAN in the airline industry. 8 day, 37.5 hr/wk, $40K+/yr depending on experience. Please respond with resume to Georgia Department of Labor, Job Order # GA 5974934, 465 Big Shanty Road, Marietta, GA 30066-3303 or the nearest Department of Labor Field Service Office.

ASTECH CONSULTANT: Utilize his knowledge of the banking industry, Tandem software and BASE24 software to solve ACI customers' Tandem and BASE 24 related problems quickly and effectively. Design, develop, test, and install customer required changes to BASE24 software in an efficient manner. Provide expert knowledge and skill to perform tuning of Tandem software and BASE24 software to maximize the performance of customer systems. Train the customer to best utilize BASE24 software. Prepare and make presentations to customers. Ability to perform consulting duties in an independent manner. Ability to manage a small team of software developers. Must have B/S, B/A in Computer Science or equivalent. 40 hours/week, $52,868.00/year. Must have proof of legal authority to work in the United States. Send your resume to Bernard Childerston, Nebraska Department of Labor, P.O. Box 94600, Lincoln, NE 68509. Refer to Job Order #NE 0162979. This advertisement is paid by the employer.

SOFTWARE ENGINEER required. Analyze, design, code & test systems software on UNIX & Windows platforms using C/C++, UNIX Shell programming & MFC (Microsoft Foundation Classes), Windows API (Applications Program Interface) & OWL (Object Window Libraries). Develop GUI's using X/Motif programming, UIL (User Interface Language) & Visual C++. Design RDBMS using Oracle-7x & related Oracle Suite Utilities. Masters Degree or its equivalent required in Math, Computers or Engineering, plus 1 year experience in the job duties described above. University work experiences (other than mere classroom study) may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary-$40,600/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. J.O. #TX7504873. Ad paid by an Equal Opportunity Employer.

PROGRAMMER ANALYSTS. Design, develop, test and document mainframe applications in the airline industry in UNISYS TIP environment using FORTRAN. Evaluate user requirements for new or modified applications. Develop and implement modified applications. Develop and implement an efficient migration plan for the new software system utilizing client server capabilities. Requires 5 years experience in a mainframe environment using UNISYS TIP environment and FORTRAN. 8 day, 37.5 hr/wk, $40K+/yr depending on experience. Please respond with resume to Georgia Department of Labor, Job Order # GA 5975248, 465 Big Shanty Road, Marietta, GA 30066-3300 or the nearest Department of Labor Field Service Office.

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APPLICATION DEVELOPMENT
Requires experience with Windows-based, client/server development using RDBMS, GUI development tools, PowerBuilder, C, C++ and Microsoft Office toolkit. Positions are also available for candidates with COBOL experience in a mainframe environment.

DATA ADMINISTRATION
Experience with Information Engineering methodology and/or CASE tools a must. RDBMS experience with ORACLE or DB/2 required. Requires logical data modeling skills, relational data management, and decision support systems experience.

DATA WAREHOUSE DESIGN
Requires experience with relational database design, relational theory, SQL, data modeling techniques, CASE tools, and decision support skills.

OBJECT-ORIENTED PROFESSIONALS
Requires experience in object technology including methodology, analysis and design, Smalltalk application development, GUI design, class library design and distributed systems.

TELECOMMUNICATIONS ENGINEERS
Minimum of 5 years experience in a network environment using Token Ring and/or Ethernet topology. Experience with analysis, design, implementation of large scale networks including: IPX/SPX, SNA, TCP/IP, Novell Network, and Windows NT Server, etc.

PERFORMANCE MANAGEMENT
Manage performance, tune and plan for a CICS, COBOL application online/batch cycle; knowledge of SAS, Strobe performance analysis tools, MVS, VSAM, JCL, COBOL/COBOL II, CICS.

TECHNICAL SUPPORT SOFTWARE PROGRAMMERS
Responsible for OEM vendor product installation and CICS support functions. Responsible for migration, configuration, maintenance and support in an MVS 5.1 Sysplex environment utilizing CICS 4.1 PTS architecture. Knowledge of SPF and JCL is required. Minimum of 3 years experience is desirable.

Allstate offers an exceptional compensation package consisting of life, medical, dental and vision insurance plans, a company-paid pension plan, 401K/profit sharing plan, and Work/Family Benefits including child/elder care, adoption, and education planning and assistance, employee assistance program, flexible spending accounts, legal care plan, long-term care and tuition reimbursement.

If you're a person who thrives on change and is stimulated and motivated by the first-time challenges that occur in a growth environment, then...being in good hands is the only place to be.™ Touch your future today – e-mail your resume to: itjobs@allstate.com; or mail/fax to: **Allstate Insurance Company, Information Technology Selection Team, 2775 Sanders Road, Suite A-1, Northbrook, IL 60062. FAX: (847) 402-6006.**

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Chief Programmer Analyst - Directs preparation of programs to process data structures, create & modify comp. operating syst. architecture by use of comp. using LISP Assembly programming lang., & Panel + screen designer software. Consults with management to identify problems. Revises existing programs to increase efficiency. 40 hrs./wk. 8AM-4PM. $37.5K. Req: 1 yr exp as a Chief Comp. Programmer or Programmer Analyst with 1 yr exp using the following Comp. Data Structures, Comp. Operating Systems, Comp. Syst. Analysis & Comp. Architecture. OR 3 Credit hrs. on to least the tech. level in the following subjects: Comp. Data Structures, Comp. Operating Syst., Comp. Systems, Analysis, and Comp. Architecture. AND 1 yr exp as a Chief Comp. Programmer or Programmer Analyst with 1 yr exp using the following: LISP programming lang., Panel + comp. lang. & Maintaining Novel Network Syst. To apply, send resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref # 67095. Employer paid ad.

Information Systems:

Monmouth College is expanding its Information Systems office. We will be filling three positions to meet needs in the following functional areas: Network Support, Documentation and Training, and Database Programming. Combined duties include: maintenance of Novell 3.12.4.1 server accounts, maintenance of AIX (Unix) accounts, installation and maintenance of network gateways, office documentation, user documentation, application program training, administrative training, creation and modification of SQL-based reports, maintenance of CASE software, creation and modification of SQL client/server programs, hardware maintenance. Combined range of expertise and experience includes: experience with the UNIX (AIX), Windows 3.1, Windows 95, Windows NT, OS/2 and Network 3.11 4.1 operating systems; SQL programming, supporting Informix DBMS, MS-SQL DBMS, and Sybase DBMS; C, C++, Pascal programming languages; Visual Basic, Delphi and Visual C++, and developmental platforms, Windows help file development, HTML publishing, and knowledge of WordPerfect word processor, Word for Windows, Lotus 1-2-3, Excel, Minitab, Novell Groupwise, Netscape, and Internet Explorer applications. We seek candidates who can assume some coordination of the duties listed above and who possess a significant segment of the total range of expertise and experience indicated. We are willing to provide some in-house training and professional development support to promising candidates. Salary is commensurate with background and experience. We offer a flexible benefits program and a smoke-free work environment. Send letter of application, resume, and at least three professional references with telephone numbers to: Michael Mitchell, Director of Personnel, Monmouth College, 700 East Broadway, Monmouth, IL 61462. 1998. Formal review of applications will begin immediately and continue until position is filled. Monmouth College is a private liberal arts college of 1,000 students affiliated with the United Presbyterian Church (USA). The College is located in Monmouth, IL, a small, friendly, Midwestern community in west-central Illinois, approximately one hour from both Peoria and the Quad Cities. E.O.E.

Hitachi Data Systems markets a broad array of industry-standard mainframe computers, data storage devices, open systems hardware and software, and information technology consulting services. We have the following opportunities available in our Professional Services division.

Software Development & Quality Assurance Consultant

Successful candidate will have 10+ years' experience in large-scale application development in both MVS and open systems environments, and detailed knowledge of formal Software Quality Assurance techniques for both structured development and rapid application development (RAD) methodologies, including 7+ years directly related experience supporting software development and SQA methodology/practice, and 3+ years managing SQA department. Requires demonstrated success of implementing SQA methods, processes, metrics and functions within large organizations, including management of cultural and organizational change and auditing of SQA practices, as well as managing large scale application development projects using formal project management methodologies and software tools. Fluency in Spanish a a plus.

Joint Application Development (JAD) Consultant

Successful candidate will have 5+ years' experience leading JAD sessions as part of commercial application development projects for large organizations and proficiency in transferring JAD skills to client staff through formal instruction and mentoring programs. Demonstrated success in achieving user satisfaction through the use of JAD techniques, including DFD's, data and process models, and success in establishing an in-house JAD program, including documentation of JAD procedures, integration with development methodologies, establishment of a JAD mentoring program, and on-going support of JAD practices are essential. Fluency in Spanish a required.

Hitachi Data Systems offers and environment committed to affirmative action and the development of diverse people. Please send, fax or e-mail your resume to: Hitachi Data Systems, ATTN: JC, 915 118th Ave. Southeast, Suite 310, Bellevue, WA 98005-3875. FAX: (206) 454-2925. E-mail: jmcastlan@aol.com

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Managing Principal Consultant. Manage development & implementation of custom applications (eg, financial, mfg. & human resources) based on employer's relational database software & 4GL application dev. tools. Develop professional staff, lead project teams, manage project costs, train consultants & provide primary liaison w/client. Must have BS in CS, Business, or Eng. & min 8 yrs software dev and including 4 yrs Oracle RDBMS business info. systems and & project leadership exp. More than 50% travel to client sites thru-out Texas & the South/Central U.S. Home office/interview exp in Irving, TX. $67,500/mo. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, JO# TX7500095. Ad Paid by an Equal Opportunity Employer.

TITLE: Systems Analyst Information Engineering Facility (I.E.F.) Systems Developer DUTIES: Analyzes user requirements, procedures, and problems to automate processing or to improve existing computer system. Confers with personnel of organizational units involved to analyze current operational procedures, identify problem, and learn specific input and output requirements, such as forms of data input, how data is to be summarized, and formats for reports. Utilizes the I.E.F. to write detailed description of user needs, program functions and steps required to develop or modify computer programs. Review computer system capabilities, workflow and scheduling limitations to determine 4 requested program or program change is possible within existing system. Studies existing information processing systems to evaluate effectiveness and develops new systems to improve production or workflow as required. Utilizes the I.E.F. to prepare workflow charts and diagrams to specify in detail operations to be performed by equipment and operations to be performed by equipment and computer programs and operations to be performed by personnel in system. Utilizes the I.E.F. to develop new information systems or meet current and projected needs. Plans and prepares technical reports, memoranda and instructional manuals as documentation of program development. Utilizes the I.E.F. to upgrade system and correct errors to maintain system after implementation. Performs business area analysis, business systems design, program construction and implementation using the I.E.F. toolset. MINIMUM REQUIREMENTS: Education: Bachelor of science degree in computer science, computer engineering, electrical engineering, mathematics or other area of major concentration appropriate to the position (or training and experience equivalent of such degree). Prior Experience: Two years prior experience in positions providing computer service(s) to either a child support enforcement agency, in a social service agency, or a government agency, in computer software development which include the following responsibilities: Use of the Information Engineering Methodology (I.E.M.) in a multi-entity environment to develop an Information Engineering Facility (I.E.F.) project. Use of Cobol, CICS, DB2, TSO/ISPF, JCL, QMF, SQL, OS/2, DB2/2, I.E.F. 5.3, C (computer) language, and Use of IBM mainframe computer and Pcs. STARTING SALARY: $58,000.00 annually. CONTACT: THIS JOB ORDER NUMBER FOR THIS JOB OPPORTUNITY IS KS5607138. PLEASE APPLY IN PERSON OR SUBMIT A RESUME REFERRING TO JOB ORDER NUMBER KS5607138 TO: Mr. Don Bruner, AEC Coordinator, Job Service Administration Unit, Kansas Department of Human Resources, 401 S.W. Topeka Boulevard, Topeka, Kansas 66603-3182. NOTE: MUST HAVE PROOF OF LEGAL AUTHORITY TO WORK IN THE UNITED STATES. Ad paid for by Employer

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Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions or client needs; analyze, design & develop computer software for clients EDP systems, enhance & maintain inventory, manufacturing & financial systems including systems analysis, design, development, maintenance, implementation, technical support & system testing. Reqs. Bach. in Comp. Sci., Electrical, Electronic or Comp. Engg., Systems Analysis, Comp. Info. Systems, Math or equiv. in ed. & exp., 2 yrs. and in job offered or 2 yrs related exp such as Systems Analyst, Programmer, Software Engineer, Consultant, Analyst/Programmer or Information Systems Specialist. Will accept 3 yrs. college ed. plus 3 yrs. and in job offered or related occup. in lieu of req'd ed. & exp. Related exp must include using LINC, COBOL, WFL, LincLite, ERGO, DM Inquiry, FORTRAN, SAS, dbase, Foxbase, Clipper & Unisys A Series & IBM compatible PC's. Must also have Novell Lan environment exp. $46,000/yr. 40 hrs/wk. 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #70398 "Employer Paid Ad"

PROGRAMMER ANALYST (2 openings) - plan, develop, test & document comp. programs applying knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives; formulate plan outlining steps req'd or develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Duties include analyses, design & development of Windows based front-end application including overall design & development of Graphical User Interface using Object Oriented Methodologies. The duties require analysis, design, development & technical support of different client server products on Windows & Windows NT using C, C++, Visual C++, Visual Basic, ODBC, SQL server, Microsoft Windows SDK, DLL's, VAX/VMS, ULTRIX, SUN SPARC Workstation, UNIX & DOS. Reqs. Bach. in Comp. Sci., Systems Analysis, Comp. Information Systems, Computer Engg., Electrical Engg., Electronic Engg., Mathematics or its equiv. in ed. & exp. & 2 yrs. and in job offered or 2 yrs. related and as a Programmer, Programmer Analyst, Sys. Analyst, Software Engr., Software Engr. (Systems Analyst) or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. and in the job offered or in a related occup. in lieu of the req'd ed. & and. Must have some related exp. which included analysis, design, development & using each of the following: Object Oriented Methodologies, Microsoft Windows SDK, ODBC, DLL's, C, ULTRIX, UNIX & SUN SPARC Workstation. $44,400/yr. 40 hrs/wk., 8:30a-5p. M-F. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref #65496. Employer Paid Ad.

Programmer Analyst - Plan, develop, test & document comp. programs applying knowledge of programming techniques & comp. systems, evaluate user requests for new or modified programs or determine feasibility, cost & time req'd, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives; develop an EAP sys. for a major electronics manufacturing company using SUN SPARC Workstation, SYBASE, POWERBUILDER, MS ACCESS, SQL, UNIX SHELLSCRIPT, UNIFACE, ORACLE, MS WINDOWS, C & UNIX. Reqs. Bachelor's in Comp. Science, Systems Analysis, Comp. Information Systems, Comp. Engg., Electrical Engg., Electronic Engg., Mathematics or its equiv. in ed. & exp. & 2 yrs. and in job offered or 2 yrs. and in related occup. as a Programmer, Programmer Analyst, Systems Analyst, Software Engr., Software Consultant Associate or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. and in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp including sys. design, dvlpmnt., integration & using each of the following: SUN SPARC Workstation, SYBASE, UNIFACE, POWERBUILDER, MS ACCESS, SQL, C & UNIX SHELL-SCRIPT. $50,000/yr. 40 hrs/wk. 8a-5p. M-F & including ref #68398. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Employer Paid Ad.

SYSTEMS ANALYST - Analyze, develop and implement, maintain, and support company accounting, management and design engineering software systems in a client server environment. B.S. Degree in Computer Science or Applied Math. 3 yrs exp in position offered or 2 yrs exp as Programmer/Analyst. 2 yrs exp must include FEA analysis, DYNAMIC 3D SIMULATION, C/C++ programming, MS ACCESS and Visual BASIC, CATIA CGS PC and UNIX based hardware and NOVELL networking support. 40 Hrs/Wk. 8 am - 5 pm; $38,600/Yr. Only persons with authorization to work permanently in the U.S. need to apply. Submit resumes to: Joseph Norris, Jr., Labor Certification Specialist, Department of Labor, MESC, 7310 Woodward Ave., Room 415, Detroit, MI 48202. Must refer to JO# 64096. Equal Opportunity Employer.

Database Analyst: Designs and develops a customized [illegible] information database system for use by universities in coordinating rate and cost data associated with grants and contract management. Tests, validates, and documents data acquisition and distribution in a relational database structure including software configuration and information databases. Models and builds specific database table structures based on an entity relational diagram using SQL and object-oriented programming. Modifies table structure to allow data population and performs inquiries to simulate operations, including establishment of screen database triggers and establishment of report functions of relational database using C, Pro*C Compiler and SQL. Uses statistical analysis system programming language to analyze rate categories and trends. Requires Master's degree in Computer Science with concentration in Data Analysis. Education to include completion of one project in each of the following: modeling and building of specific database table structures based on an entity relational diagram using SQL and object-oriented programming; modification of table structure to allow data population including performance of inquiries to simulate operations and including establishment of screen database triggers and establishment of report functions of relational database using C, Pro*C Compiler and SQL, and analysis of rate categories and trends using statistical analysis system programming language. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $38,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume or Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention: Sheila Lindsay, Reference #V-IL 15227-L. An Employer Paid Ad. No Calls. Send 2 copies of both resume and cover letter.

PROGRAMMER ANALYST (2 openings) - plan, develop, test & document comp. programs, applying knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys. & comp. capabilities, consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps req'd to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Design, analysis & implementation of systems using IBM PCAT compatibles, IBM Workstations, Stations, UNIX SVR4, BOS, X-Windows/ Motif, MS-Windows, C++, CMS/ VM, AIX 3.1, 3.2, 4.1, CDE, UIM/X, PCST, TCP/IP, Netware & GUI Tools (ND-GI). Reqs. Bach. in Comp. Sci., Systems Analysis, Comp. Information Systems, Computer Engg., Electrical Engg., Electronic Engg., Mathematics or its equiv. in ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Sys. Analyst, Software Engr., Consultant, Member of Technical Staff, Member of the Faculty for Software Training Systems Consultant or Sr. Systems Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including systems analysis, design & using each of the following: IBM PCAT compatibles, UNIX SVR4, BOS, X-Windows/ Motif, MS Windows & C++. $45,750/yr. 40 hrs/wk. 8:30a-5p. M-F. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref #69496. Employer Paid Ad.

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PROGRAMMER ANALYST (2 openings) - plan, develop, test & document comp. programs, applying knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time req'd, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives; formulate plan outlining steps req'd to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Enhance & customize sys., redesign modules, sys. testing & maintenance of existing systems. Responsibilities include porting existing systems on IBM ES9000 to HP9000, & using MVS/ESA, HP/UX, SCO UNIX, DB2, Informix, COBOL II, MF-COBOL, CICS, Unikix, ISAM & VSAM. Reqs. Bach. in Comp. Sci., Systems Analysis, Comp. Information Systems, Computer Engg., Electrical Engg., Electronic Engg., Mathematics or its equiv. in ed & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Sys. Analyst, Software Engr. or Consultant. Will accept 3 yrs. of college ed. plus 2 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Some of the related exp. must have included using each of the following: IBM ES9000, MVS/ESA, SCO UNIX, HP/UX, CICS, DB2, COBOL & ISAM, Unikix & Informix. $43,000/yr. 40 hrs/wk., 8:30a-5p, M-F. Send resume to 7310 Woodward Ave. Rm 415, Detroit, MI 48202 & include Ref #65586. Employer Paid Ad.

Consultant. 40 hrs/wk. 8am-5pm. $5500/month. Implement Client/Server solutions for business (finance) applications using Relational database technologies & open systems architecture. Lead team concerning analysis, design, development, implementation & maintenance of customized software & provide technical documentation. Develop & implement client/server solutions w/ open system architecture for financial & manufact. companies using Oracle (V6.0 & V7.1), Oracle tools (SQL*Plus 3.1, Pro*C 1.5, SQL*Forms 2.3/3.0, PL/SQL 2.0, SQL*Report writer 1.1) & Oracle Financials 9.4.2; Oracle Case Tools 5.1, Ingress v6.3 & its tools (ESQL/C, ABF, RBF & RW), Unify 2000 & Accell, Windows SDK, C, Unix & VAX/VMS. Req. Master Comp.Sci. & 2 ys exp in job or 2 ys as Software Engineer & verif ref. Must have proof of legal authority to work permanently in U.S. Send 2 copies of both resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-3 South, Chicago, IL 60605, Attn: Janet Aschenbrenner. Ref. # V-IL 15363-A. An Employer Paid Ad. No calls.

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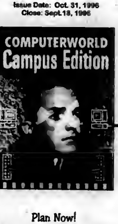

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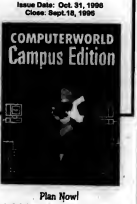

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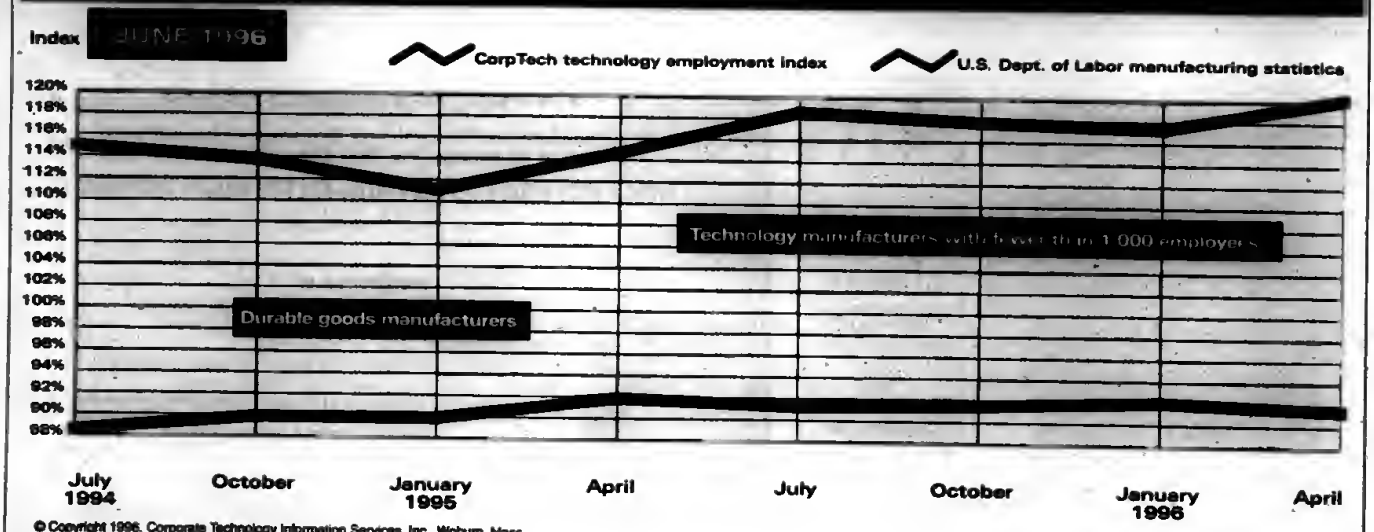

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Networking to grab spotlight at PC Expo

By Frank Hertz

PC Expo/New York
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The high-tech savvy — and not-so-savvy — will gather in New York June 17-20 for PC Expo, one of the "must-go" industry events that can be a boon or nightmare for information systems professionals. With more than 830 companies displaying their wares, sifting through the hype requires diligence. So, it's best to map out your plan of action.

PC Expo '96 will highlight wireless communications and mobile computing, CD-ROM business solutions, Integrated Services Digital Network (ISDN) and other networking technology. Keynote and plenary presentations include Sun Microsystems, Inc.'s Scott McNealy, Netscape Communications Corp.'s Jim Barksdale, 3Com Corp.'s Eric Benhamou and IBM's John Whiteside.

Here's how some experienced attendees plan to spend time at the show:

TOM HEBBERSON
Vice president of engineering
Unitel, Inc.

"I want to see if any of the new network assistant hardware is out there and whether or not they're just warmed-over Sharp personal organizers on steroids. One of my other goals is to look at the major advances in firewall technology, especially proxy firewalls.

"I'm also looking for advances in desktop scanning equipment to try to get all the paper off my desk and onto my PC. I also think [Virtual Reality Modeling Language] and 3-D organization on the Internet is an exciting wave that's about to break."

MICHAEL MCKEBNA
Area manager of network services
American International Group (AIG)

"AIG has connectivity in 90 countries, running large networks like frame relay. Our goal at PC Expo is to look for ways to provide connectivity while reducing costs and increasing productivity. That includes multimedia, ISDN, CD-ROM products and workflow applications. We'll also look heavily at the Internet."

PAULA OLSEN
Corporate director of electronic commerce
Arrow Products, Inc.

"My goal is always to connect with people who will be a future resource for questions I don't even know I have yet; in other words, networking. I'm also looking for Web authoring tools, encryption standards for electronic commerce and net management tools.

"My plan of attack is to learn what I can at seminars, and then once I know the terminology and concepts and questions, then I go upstairs to the floor and look around."

MARK BROOKS
Senior LAN specialist
Teachers Insurance Annuity Association

"PC Expo, in addition to being very convenient, has always featured a growing population of media and Internet people who want to find out what's going on in the industry. It's a great place to meet industry people and get a leg up on what's going on.

"Specifically, I want to learn about the changing network arena, the latest planned Novell operating systems and the impact of Windows 95 and NT in the desktop environment."

WILLIAM GRAHAM
Manager of Internet/Web technologies
The Chase Manhattan Bank Corp.

"Client/server application development is our primary interest. We need to look into new intranet capabilities, but mostly we're looking for Internet transaction processing. As with many companies, we're trying to figure out where the technology is going to fit into the organization." ●

Hertz is a freelance writer in Boston.

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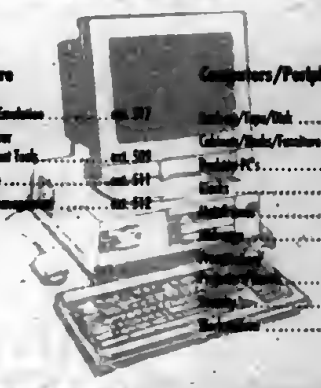

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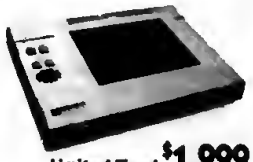

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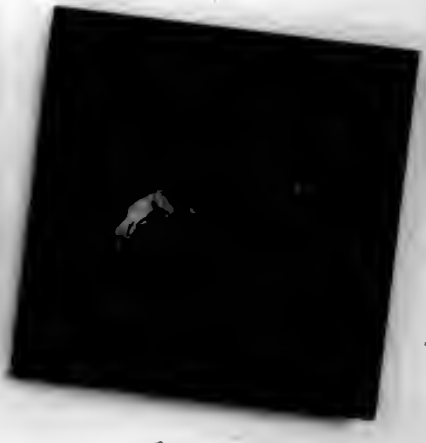
Finance & Investing

Next week: Safe harbor law lets companies say more



David Gardner, *co-founder of The Motley Fool, revels in the glory of online information*

'Fool-hearty' investing

One of the most popular cybersites for investors is The Motley Fool, which resides in the Personal Finance area of America Online. The site grew out of the experience of two brothers, Tom and David Gardner, who in their early 20s started investing money entrusted to them by their parents. As neophyte investors, the brothers were appalled by the lack of information, education and advice available for beginners. In 1993, they launched their own, slightly irreverent, investment newsletter. Shortly thereafter, the two started a message folder on AOL, which quickly blossomed in popularity. Based on that, AOL invited the brothers to host their own online area, which was officially launched in August 1994. Most recently, the brothers have published *The Motley Fool Investment Guide*. Senior editor Tam Harbert talked with David Gardner to learn more about the brothers' "Foolish" mentality.

Q: Why has The Motley Fool become so popular?

A: I think there are several reasons. Among them is our emphasis on reforming what we consider to be the abuses and misinformation from the establishment investing world, which often jeopardizes the chances of small investors. For example, for some reason, brokers are paid based on how often the accounts are traded, not on how well they do. That obviously creates a direct conflict of interest in which brokers tend to trade accounts more than they should, which really hurts investment returns.

Also, there is no investment education of any kind in America, which has created this incredible void that allows misinformation and abuse to exist. For example, investors are often encouraged to go into mutual funds, but mutual funds, as a group, underperform the market averages. It would be strange enough if it was only 30% of them, but it's 80% of them that underperform the market, and that's downright bizarre.

So when you have situations like that — where individual investors are getting a raw deal — and you create a service that enlightens people, demystifies the financial world, you tend to build a cult-like following.

Q: What is the Motley Fool investment philosophy?

A: I can't summarize it in a pithy paragraph or two here. But here are some of our foundations: Buy stocks, not mutual funds; buy stock in companies you know, whose products you understand and use; buy and hold (don't trade actively); learn the Dow Dividend approach (see our book or online area for a thorough explanation of this) because it's a superb way to start; don't rush into investing — take the time to learn slowly; and invest for the long term.

Q: How do you think online forums are changing the nature of investing?

A: It's just so much more powerful than any other existing medium: information distributed instantly and nationally, you can learn at your own pace interactively, and you have all these people to listen to, who'll help flesh out every side of every argument.

Most people don't have anybody, except maybe their spouse, that they can talk comfortably with about investments. They may have a broker, but often they feel intimidated by that person. In our [online] area, we have an "Ask A Stupid Question" folder and a message board discussion titled "My Dumbest Investment," which is an incredible education in and of itself.

Q: Do you know what percentage of your followers are employed in high-tech professions?

A: All I can say is that we have a lot of them. And another one of our Foolish maxims is that the distinction between tech and nontech is going to become increasingly irrelevant in terms of stocks. We think just about everything will be a technology stock in about 10 years. So much of the information that used to be published in print or broadcast over television, so much of the merchandise that used to be sold in stores, is all going online and is going to be linked more to technology.

Q: When will you be on the World Wide Web?

A: The Fool is at its interactive best on AOL, but we're just now getting on the Web, too, though our site is under construction. It's at fool.web.aol.com, and anyone's welcome to check it out.

David had a lot more to say than we could fit on this page. For a full transcript of the interview, visit

COMPUTERWORLD
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The Week in Stocks

Industry Almanac

You make the call

When will the cellular market improve? If you think you know the answer, you might be able to time some profitable purchases of **Motorola, Inc. (NYSE:MOT)** stock.

The stock soared last summer, reaching $82, according to Todd Koffman, a vice president at Dean Witter, Discover & Co. in New York. In January, it dropped below $50, at least partly in response to margin pressure in the cellular business. Cellular telephone prices fell 30% to 40% last year, Koffman says.

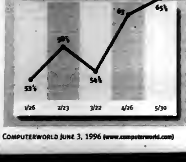
But the stock has rallied again, reaching approximately $60. Koffman has an accumulate rating on the stock because the variety of wireless technologies — including cellular, personal communications services (PCS), radio and paging — have strong growth prospects, he says.

"In the long term, I'm a believer in wireless communications systems, and that's what Motorola's business is now being driven by," he says. "I could see this stock exceeding $70 coming off the rally we've just experienced, with momentum continuing to build through 1997."

Koffman says he sees indications that pricing pressures in the cellular market are starting to moderate, which should help stabilize Motorola's margins. And the PCS network, which should be in operation by early next year, will be an important development for the company.

But Robert Maire, a vice president at Morgan Stanley & Co. in New York, maintains a neutral rating on the stock. Motorola's two main markets — cellular and semiconductors — have both slowed, he notes. *— Tam Harbert*

Motoroling right along



Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
COMS	53.63	30.50	3COM Corp	49.25	-1.63	-3.2
AIT	88.88	47.25	Ameritech Corp.	56.75	-3.00	-5.0
AXE	29.13	15.63	Anixter Intl.	16.88	-0.50	2.9
APTS	11.13	2.25	Apertus Tech.	4.88	0.00	0.0
T	49.88	49.13	AT&T	62.38	-0.63	-1.0
ASND	71.25	9.25	Ascend Communications	88.50	0.25	0.4
BNYN	18.63	6.00	Banyan Systems Inc.	9.19	-0.69	-7.0
BAY	50.88	29.88	Bay Networks Inc.	29.88	-1.13	-3.7
BEL	80.38	43.50	Bell Atlantic Corp	62.38	-1.38	-2.2
BLS	45.88	29.38	BellSouth Corp	41.38	-0.63	1.3
BRKT	49.00	9.13	Brooktrout Technology	40.88	1.50	3.4
CS	87.75	48.63	Cabletron Systems	73.00	-4.13	-5.3
CSCC	60.25	10.31	Cascade Communications	57.25	0.38	0.7
CGRM	29.11	11.75	Centigram Communications	17.13	-0.38	-2.1
CSCO	37.88	11.13	Cisco Systems Inc (H)	35.00	-2.13	-3.7
CLIX	11.38	4.50	Compression Labs Inc.	7.25	0.25	3.3
CMNT	12.75	4.88	Computer Network Tech	8.25	-0.50	-5.7
XCOM	14.50	8.25	CrossComm	11.13	0.31	2.9
DIGI	64.88	21.88	DSC Communications	30.25	0.38	1.3
FORE	89.50	75.50	FORE Systems Inc (H)	80.25	-8.25	-9.3
GDC	21.88	9.88	General Datacomm Inds.	15.88	-0.38	-2.3
GSX	42.50	39.88	General Signal Networks	38.25	-0.75	1.9
GTE	49.25	32.25	GTE Corp	42.25	-2.13	-4.7
LU	38.23	29.75	Lucent Tech. (H)	38.25	0.50	1.3
MCIC	31.13	19.38	MCI Communications Corp	29.00	-0.88	-2.9
MICM	14.38	3.50	MICOM Communications Corp	11.61	0.06	0.3
MNPI	34.50	50.18	Microcom Inc	70.00	0.63	3.3
NETM	38.00	9.38	NetManage Inc.	16.73	-1.00	-5.6
NTRX	9.25	3.63	Netrix Corp	9.25	1.00	25.8
NCDI	12.00	1.88	Network Computing Devices	3.50	0.00	0.0
NWK	42.00	21.00	Network Equipment Tech.	27.63	-0.63	-2.2
NETG	38.73	11.50	Network General (H)	29.88	0.38	1.6
NN	74.23	25.00	Newbridge Networks Corp. (H)	71.63	-2.13	-2.9
NT	54.50	31.50	Northern Telecom Ltd (H)	54.50	0.50	0.9
NOVL	21.63	11.38	Novell Inc	14.31	-1.13	-2.3
NYN	59.25	39.25	Nynex Corp	40.13	-0.68	-1.9
OCTL	38.25	11.63	Octel Communications Corp	14.50	-0.73	-3.0
ODSI	43.15	17.00	Optical Data Systems Inc	12.73	1.13	-4.7
PAC	35.25	75.63	Pacific Telesis	33.23	-0.63	-1.8
PCTL	44.71	30.75	PictureTel Corp.	30.00	1.25	3.3
PTON	10.75	4.75	Proteon Inc.	3.50	-0.44	-7.4
RACO	7.88	3.88	Racotek Inc.	6.00	-0.38	-5.9
RETX	10.88	1.61	Retix	8.88	-0.88	-9.0
SBC	40.25	41.38	SBC Communications	49.11	1.00	2.0
SFA	13.38	11.38	Scientific Atlanta Inc.	16.88	-0.63	-3.3
SHVA	75.13	16.13	Shiva Corp	75.13	1.88	4.0
FON	45.50	29.23	Sprint Corp	42.50	-0.88	-2.0
SMSC	23.50	12.50	Standard Microsystems Corp.	15.38	-1.13	-6.8
STRM	57.50	16.00	Stratacom Inc (H)	58.50	-2.13	-3.7
TRIT	11.38	2.38	Telebit Corp	11.38	2.50	28.2
USRX	105.50	20.50	US Robotics	94.50	-2.00	-2.1
USW	40.38	28.38	U S West Inc.	32.50	-1.13	-3.3
XIRC	17.50	8.88	Xircom	16.23	0.50	3.2
XYLN	76.00	51.23	Xylan Corp	63.38	-4.13	-6.1

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
AALR	10.38	3.61	Advanced Logic Research	9.63	-0.11	-1.3
AAPL	50.13	29.00	Apple Computer Inc	38.38	-0.38	-1.0
ASTA	18.88	4.63	AST Research Inc.	7.94	0.31	4.1
CPQ	56.75	35.88	Compaq Computer Corp	48.50	0.50	1.0
DELL	51.38	29.00	Dell Computer Corp	51.38	1.63	11.3
GATE	40.75	17.38	Gateway 2000 Inc.	38.00	1.38	3.8
HWP	113.38	64.13	Hewlett Packard Co.	107.00	1.13	1.1
MUEI	29.88	9.00	Micron International Inc.	11.94	-0.08	-0.6
NIPNY	75.13	31.00	NEC America	53.13	1.13	-2.0
SGI	45.63	21.13	Silicon Graphics	27.50	-0.88	-3.1
SUNW	66.00	19.75	Sun Microsystems Inc (H)	63.25	1.63	2.6

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
AMH	13.50	6.75	Amdahl Corp	11.63	-0.63	5.1
DGN	19.11	7.63	Data General Corp	11.88	2.23	-16.9
DEC	76.50	35.13	Digital Equipment Corp	31.00	-0.38	-0.7
IBM	128.88	83.13	IBM	107.50	1.25	-1.1
MDCD	20.25	3.25	Meridian Data Inc.	17.31	-0.81	-4.3
NETF	7.50	3.88	NetFrame	5.00	0.00	0.0
SQNT	75.38	10.13	Sequent Computer Sys.	13.63	-0.38	-2.7
SEQS	10.00	2.88	Sequoia Systems Inc.	1.61	-0.13	3.2
SRA	38.11	23.00	Stratus Computer Inc.	29.88	1.25	10.1
TDM	17.50	8.38	Tandem Computers Inc.	12.63	-0.13	-1.0
TRCO	6.94	1.00	TriCord Systems	6.25	0.31	5.3
UIS	11.50	5.50	Unisys Corp	8.25	0.25	3.1

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
ADBE	74.25	30.00	Adobe Systems Inc.	17.13	-3.56	-6.8
AMSWA	8.75	1.63	American Software Inc.	5.25	0.38	7.7
APLX	42.50	8.25	Applix Inc	32.50	-1.50	-4.6
ARSW	82.75	28.75	Arbor Software	60.75	0.75	1.3
ACAD	53.00	27.25	Autodesk Inc.	40.75	0.00	0.0
BACH	11.88	4.63	Bachman Info. Systems	8.25	0.25	3.1
BGSS	50.00	29.50	BGS Systems Inc. (H)	50.00	7.25	17.0
BMCS	67.25	31.25	BMC Software Inc	63.23	-0.75	-1.2
BOOL	26.73	19.23	Boole and Babbage	38.50	-0.50	-2.0
BORL	21.25	10.13	Borland Int'l Inc	13.25	-1.13	-13.8
BOBJY	55.50	15.25	Business Objects	40.00	0.50	1.1
CYE	17.88	14.13	Cheyenne Software Inc.	21.38	-0.75	-3.4
COGNF	27.38	8.23	Cognos Inc.	24.00	-0.25	-1.0
CA	82.11	37.23	Computer Associates	73.25	0.38	0.5
CVN	13.50	4.88	Computervision Corp	11.75	0.63	5.6
CPWR	39.25	15.50	Compuware Corp	39.25	1.63	7.2
CSRE	30.50	11.13	Comshare Inc. (H)	29.50	-0.25	-6.8
COSFF	19.50	8.38	Corel Corp	11.50	-0.75	-5.7
DWTI	15.75	3.75	Dataware Technologies Inc.	6.81	0.31	4.8
DSLGF	32.25	7.88	Discreet Logic Inc. (L)	8.25	0.00	0.0
FILE	67.00	30.75	FileNet Corp	40.75	-0.75	-1.6
DDDDF	8.25	1.56	4th Dimension	6.50	0.63	20.6
FTPS	40.63	8.13	FTP Software Inc.	11.75	0.13	1.1
GSOF	16.00	7.00	Group 1 Software	50.25	0.25	2.5
GPTA	17.13	4.13	Gupta	4.75	0.00	0.0
HUMC	28.88	17.00	Hummingbird Comm. Ltd.	22.13	1.63	-6.8
HYSW	28.38	9.73	Hyperion Software Corp	14.38	0.50	3.4
IRIC	38.63	10.00	Information Resources	12.75	0.00	0.0
IFMX	36.73	18.88	Informix Corp	13.00	2.13	10.2
INGR	20.13	10.88	Intergraph Corp.	13.13	-0.50	-3.7
LEAF	12.63	3.88	Interleaf Inc.	7.88	-0.25	-3.1
ISLI	26.25	8.73	Intersolv Inc.	11.75	1.63	16.0
INTU	89.23	31.00	Intuit Inc.	32.25	0.75	1.5
LGWX	22.25	30.88	Logic Works	11.38	-0.25	-1.6
MANU	20.50	9.50	Manugistics Group Inc.	11.75	-0.44	-2.7
MAPS	40.00	10.00	MapInfo Corp.	16.75	0.00	0.0
MATH	9.25	2.25	MathSoft	7.88	-0.13	-1.6
MCAF	43.88	12.13	McAfee Associates	38.00	0.00	0.0
MENT	22.88	30.88	Mentor Graphics	18.00	0.00	0.0
MIFGY	21.75	8.25	Micro Focus	14.25	-0.50	-3.4
MGRI	38.63	6.00	Micrografx Inc.	16.88	-0.68	-4.9
MSFT	130.00	79.88	Microsoft Corp	118.50	-0.13	-0.1
ORCL	38.75	32.13	Oracle Corp	33.25	-0.13	-0.4
PMTC	43.75	30.88	Parametric Technology	45.38	2.38	5.5

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
PARQ	14.63	6.63	ParcPlace Systems Inc. (H)	13.23	-0.63	-4.3
PSFT	71.25	24.38	PeopleSoft	70.25	0.75	1.1
PTEC	19.75	8.63	Phoenix Technologies (H)	19.38	1.38	7.6
PSQL	16.88	3.13	Platinum Software	10.50	-0.63	-5.6
PLAT	26.00	11.25	Platinum Technology	17.63	0.50	2.9
PRGS	38.00	14.63	Progress Software Corp	13.50	-3.13	-6.8
RNBO	26.75	16.88	Rainbow Technologies Inc.	22.73	0.38	1.7
REDB	61.00	29.50	Red Brick Systems Inc.	47.13	0.38	0.9
ROSS	8.13	2.19	Ross Systems (H)	7.00	-0.38	-5.1
SCOC	12.13	5.50	SCO Inc.	1.63	-0.25	-3.2
SDTI	95.25	17.63	Security Dynamics Tech.	89.23	1.50	1.1
SKEY	31.75	15.38	Softkey International Inc.	75.00	-1.00	-3.8
SPCO	5.13	2.19	Software Publishing Corp.	2.73	0.13	4.8
SQAX	38.25	16.00	SQA Inc.	35.00	-0.50	-1.4
SOTA	19.13	6.63	State of the Art	19.13	0.50	2.1
SSW	81.00	33.25	Sterling Software Inc.	81.00	2.13	2.7
SDRC	37.38	10.38	Struct. Dynamics Research	28.63	-1.00	-5.0
SYBS	39.75	20.88	Sybase Inc.	22.88	-2.13	-8.5
SYMC	33.25	9.88	Symantec Corp.	13.68	-0.81	-4.9
SNPS	46.50	25.00	Synopsys (H)	44.63	-1.63	-3.5
SSAX	30.63	12.63	System Software Assoc.	17.00	-1.00	-5.6
SYSF	54.75	8.75	Systemsoft Corp. (H)	46.75	-3.25	-6.3
TRUV	10.13	4.00	Truevision Corp	8.00	-0.63	-7.2
VIEW	17.50	9.63	ViewLogic Systems	15.38	-0.50	-3.3
VMRK	21.50	5.75	VMark Software Inc.	11.50	-0.63	-5.2
WALK	12.75	4.63	Walker Interactive Systems	11.25	-0.23	-2.1
WALL	23.75	13.00	Wall Data Inc. (H)	22.25	-0.75	-3.3
WANG	20.13	12.38	Wang Laboratories Inc.	29.13	-2.25	-9.6

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
AMER	71.00	14.75	America On-Line	56.50	5.00	9.7
BBN	48.75	16.50	BBN Corp	26.38	-1.50	-5.4
CSRV	35.50	22.75	CompuServe Corp (L)	24.75	1.75	1.6
LCOS	39.25	16.00	Lycos Inc.	18.13	-0.68	-5.1
NETC	91.50	19.29	Netcom On-Line	33.94	-5.58	-14.1
NSCP	82.00	22.88	Netscape Comm. Corp.	68.13	-5.88	-7.9
PSIX	29.00	6.75	PSINet	14.25	-1.75	-10.9
QDEK	39.50	8.88	Quarterdeck Corp	14.60	-0.94	-6.0
RAPT	38.23	22.75	Raptor Systems	30.25	-0.75	-2.4
SCUR	64.50	19.00	Secure Computing Corp.	34.00	3.50	10.3
SPYG	61.00	13.25	Spyglass Inc.	27.38	0.88	3.3
UUNT	98.75	22.25	UUNET Tech.	59.94	-2.06	-3.3
YHOO	43.00	24.50	Yahoo! Inc.	28.00	-1.50	-5.1

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
AMD	39.23	16.13	Advanced Micro Devices	37.63	0.13	0.7
ADI	30.13	17.50	Analog Devices Inc.	27.25	-0.13	-0.4
CHPS	11.88	7.88	Chips and Technologies	10.88	0.75	2.4
CRUS	61.13	17.00	Cirrus Logic	11.23	-0.13	-0.6
CY	29.75	10.00	Cypress Semiconductor Corp	14.13	0.50	3.7
CYRX	49.75	18.25	Cyrix	32.13	-1.38	-4.2
INTC	78.38	49.81	Intel Corp.	75.23	4.19	3.8
LSI	42.50	32.50	LSI Logic Corp	31.50	1.88	6.3
LSCC	63.00	26.38	Lattice Semiconductor	75.13	4.13	13.3
MCRL	32.50	12.25	Micrel Semiconductor Inc	16.50	0.00	0.0
MU	94.75	27.50	Micron Technology	32.73	2.50	8.2
MOT	82.50	44.75	Motorola Inc	68.73	1.63	2.3
NSM	33.63	13.50	National Semiconductor	16.50	0.25	1.3
TXN	83.75	42.75	Texas Instruments	50.50	3.63	11.1
TXCC	21.63	7.88	TranSwitch Corp	16.75	-2.13	-11.3
VLSI	39.13	10.75	VLSI Technology	17.38	-0.25	-1.4
WWTK	6.88	1.00	Weitek	1.38	-0.06	-4.3
WDC	29.00	14.38	Western Digital Corp.	26.23	-0.38	-1.6
XLNX	55.50	23.25	Xilinx	50.63	3.75	12.1
ZLG	54.13	20.50	Zilog Inc.	38.88	0.75	2.1

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
APCC	25.88	7.88	American Power Conversion	11.69	0.94	8.0
ADPT	61.00	29.75	Adaptec Inc.	80.23	0.63	1.0
CBEX	13.13	3.00	Cambex Corp	6.25	-0.50	-7.4
CGN	7.75	3.06	Cognitronics Corp	4.88	0.00	0.9
CREAF	14.13	5.75	Creative Technologies Inc.	7.00	0.81	13.1
RACE	13.13	3.63	Data Race Inc.	4.38	-0.13	2.8
DTM	9.38	4.13	Dataram Corp.	6.23	0.31	3.3
EMC	27.38	13.00	EMC Corp	32.13	0.13	0.6
EMLX	30.50	6.38	Emulex Corp	38.88	-2.38	11.2
ESCC	29.00	13.50	Evans and Sutherland	24.50	-2.13	-8.0
EXBT	22.75	10.00	Exabyte	19.63	-0.94	-4.6
IISLF	4.25	1.50	Intelligent Info. Systems	7.06	-0.19	-0.3
IOMG	55.13	2.38	Iomega Corp (H)	43.13	1.13	2.6
IPLSA	8.25	2.50	IPL Systems Inc. (H)	7.38	0.00	0.0
KMAG	37.50	19.75	Komag Inc	38.75	1.50	4.1
MTSI	27.50	11.23	Micro Touch Systems Inc.	21.50	2.00	10.3
PEAK	36.75	12.75	Peak Technology Group	23.25	-3.00	-11.2
PNCL	19.75	6.63	Pinnacle Micro Inc.	50.00	0.25	2.6
PTNX	38.75	13.50	Printronix Inc	24.50	2.00	8.9
AQM	6.75	3.25	QMS Inc.	5.88	-0.13	-2.1
QNTM	28.50	15.88	Quantum Corp	26.19	-0.50	2.3
RDUS	14.00	0.94	Radius Inc.	3.38	-0.38	-50.0
SEG	87.75	34.50	Seagate Technology	59.13	-1.00	1.7
STK	32.00	21.00	Storage Technology	58.50	-0.63	-1.8
STLC	8.75	1.25	StreamLogic Corp.	8.25	-0.44	-0.5
TEK	61.88	29.75	Tektronix Inc.	37.88	0.00	0.0
XRX	160.38	109.38	Xerox Corp. (H)	137.88	-2.13	-1.3

Exch	52-Week Range			May 31 3 PM	Wk Net Change	Wk Pct Change
AMSY	33.38	14.63	American Mgmt. Systems	28.73	3.63	11.2
ANLY	63.75	24.75	Analysts Int'l	42.00	-0.75	-1.1
AUD	43.38	30.50	Auto Data Processing	38.25	-0.13	-0.3
CATP	82.63	31.00	Cambridge Tech. Partners (H)	77.25	-3.75	-4.6
CEN	54.25	31.63	Ceridian Corp	52.38	0.50	1.0
CDO	28.25	18.88	Comdisco Inc.	27.50	-0.63	-2.2
CHRZ	16.00	8.13	Computer Horizons	45.63	1.63	3.7
CSC	80.75	31.75	Computer Sciences	78.00	1.63	2.1
TSK	31.88	10.75	Computer Task Group	38.13	-1.38	-4.7
CPU	48.75	12.13	CompUSA Inc. (H)	44.75	-2.25	3.8
CDAT	27.50	8.63	Control Data Systems Inc.	25.00	2.38	10.5
EGGS	14.25	5.00	Egghead Discount Software	11.25	0.25	2.2
GME	16.00	41.50	General Motors E (EDS)	55.50	1.13	2.1
IMAC	24.25	9.13	Inacom Corp	75.38	-0.50	-2.3
INEL	14.63	3.50	Intelligent Electronics	9.81	-0.31	-3.1
KEA	41.75	18.25	Keane Inc.	39.75	-0.25	-0.6
MSEL	0.38	2.25	Merisel	4.25	-0.31	-6.8
MKA	13.00	7.25	Microage Inc.	13.25	0.63	3.0
PAYX	67.13	19.25	Paychex (H)	44.00	-1.75	-3.8
PMS	54.25	42.63	Policy Management Sys.	53.00	-0.25	-0.5
REY	51.50	20.13	Reynolds and Reynolds (H)	50.00	-1.13	-2.20
SCBI	30.50	15.75	SCB Computer Tech. Inc.	30.75	-8.50	-29.08

KEY (H) = New annual high reached in period (L) = New annual low reached in period

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Periodical postage paid at Framingham, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385697. Computerworld (ISSN 0010-4841) is published weekly, except a single combined issue for the last week in December and the first week in January by Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. [illegible] Computerworld can be purchased on microfilm and microfiche through University Microfilms Inc., 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed. Back issues, if available, may be purchased through the circulation department. Photocopy rights: permission to photocopy for internal or personal use is granted by Computerworld, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, Computerworld, Inc., 500 Old Connecticut Path, Box 9171, Framingham, Mass. 01701-9171. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: $4.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $150 (surface) a year; Europe — $295 a year; all other countries — $295 a year. Subscriptions call toll free (800) 669-1002. POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43305.

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Double the performance

HP revs up high-end workstation line with 64-bit chip

By Craig Stedman

Hewlett-Packard Co. will belatedly join the 64-bit computing era this week by introducing workstations with twice the power of its current models.

But sources said the extra speed won't come cheap.

HP is starting off its PA-8000 microprocessor in the higher reaches of its HP 9000 workstation line. The entry-level 64-bit machine has a base price of about $25,000. Adding good three-dimensional graphics will boost the cost close to $30,000, said sources familiar with HP's plan.

64-bit computing

The cost of moving up to the PA-8000 is one of the key factors being watched by throughput-hungry HP customers such as Mark Gruenwald, computer-aided design and manufacturing manager at Brunswick Corp.'s Mercury Marine division in Fond du Lac, Wis.

The outboard motor manufacturer, which has about 100 HP workstations, expects to go the 64-bit route on its next purchase if they are "able to work out a deal with HP where the price differential is slim enough" between the new machines and their 32-bit predecessors, Gruenwald said.

He said the $25,000 starting price for a C-class desktop box equipped with the PA-8000 "seems reasonable" given the performance boost that HP has promised (see chart). "It is a high-end workstation that we're talking about," Gruenwald said.

Matt McLaughlin, assistant systems administrator at the University of Iowa's College of Engineering in Iowa City, agreed that HP's new machines look potent from a price and performance standpoint. "As far as benchmarks go, they blow everybody else away," McLaughlin said. "And HP usually stays in line between its benchmarks and real-world performance."

In need of a boost

HP's workstations are sorely in need of a shot in the arm because rivals Sun Microsystems, Inc., Digital Equipment Corp. and Silicon Graphics, Inc. all beat HP to market with 64-bit machines.

The 180-MHz PA-8000 should move HP from the bottom of the performance rankings to the top, said Greg Weiss, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. But it won't help in the higher-volume market for $10,000 to $20,000 boxes, where HP remains "fairly weak," he said.

HP plans to cut the $17,000 starting price of current C-class machines to make them more appealing. But Weiss said the 32-bit boxes still won't look too good next to Sun's Ultra 1 workstations, which are 64-bit systems that start at about $10,000.

HP's announcement will include 64-bit models of its C-class machines and its J-class deskside series, which supports two processors. Board upgrades will be offered for existing versions of those systems. HP already priced the C-class upgrade at $7,000.

The firm is also introducing a workstation version of HP's K-class Unix server with up to four PA-8000s and a high-performance graphics subsystem. Sources said that machines will typically cost $70,000 or higher.

The 64-bit machines were supposed to ship in the first quarter but were held up when HP had trouble getting enough cache memory chips for the PA-8000.

Upward bound

Hewlett-Packard's 64-bit workstations compared with its current machines

	SPECint95	SPECfp95	Base price
C100	3.67	6.2	$17,000
C120	4.41	7.45	$20,000
New 64-bit C-class model	11.8*	20.2*	$25,000

*HP's estimate

Sun adopts a 64-processor machine. See page 39.

Lotus

CONTINUED FROM PAGE 1

Notes and CC:Mail users exchange mail across either a CC:Mail or Notes backbone. This would simplify the cohabitation of Notes and CC:Mail users during migration.

Notes 4.0 users are just getting their hands on Notes 4.1, an upgrade that adds support for many new client and server platforms.

Even more significantly, Lotus begins beta-testing this week a combined Web/Notes server that was expected to be delivered by mid-year. But the server software — called Domino (see chart) — probably won't hit the streets until late summer, Lotus officials said. Notes 4.0 has been available since January.

"A lot of users are holding off now [on Notes migration], the primary reason being to look at the Internet as an option to off-load some of the Notes infrastructure," said Ian Campbell, an analyst at International Data Corp. in Framingham, Mass.

One user said her group put CC:Mail-to-Notes migration on hold because it hasn't seen any of the migration tools yet. And Sedgwick & James, a law firm in Memphis, stopped converting its CC:Mail users to Notes Mail until the migration tools show up, said Missy McElwee, manager of Notes development. The firm tried to do the move on its own but ran into enough complications to warrant halting the effort.

Colgate-Palmolive Co., with 13,000 CC:Mail users, is preparing to take a look at the beta release of the CC:Mail migration tool.

"We're going to set up a lab, test it and, hopefully by the fourth quarter, start to convert the first group of CC:Mail users," said Jim Arcure, manager of systems integration at the New York firm.

Arcure's position is echoed by many Notes 3.x users, who have voiced a willingness to take their time switching to Notes 4.x [CW, March 18].

Features of Domino

- Native HTTP support so Web browsers can view Notes data in HTML format
- The ability to serve HTML* documents from the Notes file system
- Notes Access Control so Web site designers can restrict user access to Notes-managed Web sites
- Support for Windows NT, Solaris, AIX and HP-UX Notes servers

*Hypertext Markup Language

Yet some loyal Notes users have been eagerly awaiting Domino, a Notes server with native support for Hypertext Transport Protocol (HTTP).

The concept has received good reviews from observers, but any delay in getting Domino on the streets could bode ill for Lotus, especially when the Internet measures time in "Web years" that are really just months.

Input, a market research firm in Mountain View, Calif., recently predicted Notes has only two more years of market dominance before Internet and intranet technologies become the dominant architecture. That would give Lotus even less room for error in getting its updates out to users, observers said.

MCI 'net delays

CONTINUED FROM PAGE 1

about specific complaints raised by individual users. But he said the April upgrade in MCI's national backbone, from 45M to 155M bit/sec., should have improved throughput and performance for MCI customers. He also said network congestion had forced MCI to put a moratorium on installing new T1 lines for customers, but the company resumed installing T1 lines in mid-April.

Yet in interviews last week, a half-dozen MCI customers — mostly small Internet service providers — said problems linger.

"MCI can string you along until you're broke," said William Manalo, owner of Manalo Communications Services in Glendale, Calif. He said MCI promised in January to install a T1 line to the 'net by Feb. 20.

But MCI missed that deadline, promised two other deadlines and missed those, too, Manalo said. He said he finally gave up on MCI and purchased his Internet service from Pacific Bell.

That solved Manalo's Internet connectivity problem. But it didn't solve his financial problems — his small business lost about $20,000 due to MCI delays, he claimed.

"MCI's going through growing pains," said Jeffrey Kagan, president of Kagan Telecommunications Associates in Atlanta. "Everyone's being caught rushing to keep up. I don't think it's a weakness on [MCI's] part."

But analysts were unable to provide specifics on other delays.

Complaints about MCI include the following:

- One Call Systems, an Internet service provider in Ashland, Ky., ordered a T1 line from MCI in November. It said MCI missed installation deadlines of Feb. 1 and Feb. 15. MCI gave One Call shared access to a T1 line on Feb. 27 but said it wouldn't be able to fill the order until April 15 at the earliest, One Call officials said. One Call is still waiting, Vice President Ray Bobbitt claimed.
- Prime Solutions, a cable and wide-area networking company in Phoenix, ordered a T1 line from MCI six months ago. Tom Farkas, a WAN technician at Prime, said he was told installation would take 45 days. Instead, it took about four months. "We had wanted to be up and running long before this. Our business plan had us getting up and running in April. Now we're looking at the end of June," Farkas said.
- And problems ripple beyond MCI's direct customer base. Engineers at Entertainment Technology Associates, Inc. in Santa Monica, Calif., faced transmission delays in February and March so great that they had to work at midnight to get adequate response times, said President Bill Elswick. The problems at the firm, which specializes in remote systems administration and World Wide Web site maintenance, disappeared in early April when Entertainment Technology's Internet service provider rerouted traffic to bypass the MCI backbone.

Clark emphasized the company's desire to work through all its users' problems. He said he assumed that MCI employees monitor the online forums occasionally, but there is no formal program in place to respond to customer complaints that way.

Users said they continued to do business with MCI for several reasons. They said they were dazzled by MCI's reputation for good service and believed sales representatives who said their problems would be solved in a week or two — even when those promises were repeated over and over.

Utilities are gearing up to compete with telecom providers. See page 59.

NT master domains hike administrative woes

Charles Babcock

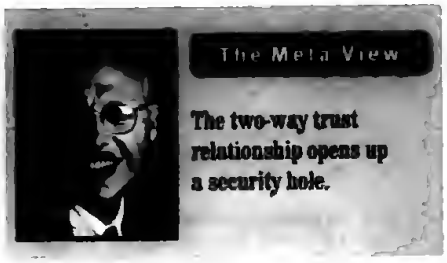
Tight security is a selling point for Windows NT. But, when NT Server is used to run the network, security has its limits.

NT networks in large organizations frequently must employ multiple master domains under NT's design scheme. Administering multiple master domains is demanding, and human error can open a hole in the network's security.

The culprit is NT Server's lack of a global directory and its resulting use of trusting relationships between master domains. A master domain is a central point of administration on an NT Server network. The master domain implements the security and accounts for many types of users. Users log in through an authentication server in a master domain.

When more than one master domain is created, however, a two-way trust relationship is established. This lets users in a second master domain access resources controlled by the first.

Two-way trust gives a user who isn't in a home office access to accustomed resources. In the eyes of NT critics, however, two-way trust opens up a security hole. When one administrator is creating user accounts and assigning them privileges that can't be seen by the administrator of another master domain, "you've lost control of your system," asserts Robert Harbison, president of Network Integration Consultants, a network design firm in Sausilito, Calif.



Have faith

Microsoft NT Server product manager Enzo Schiano counters that no matter how you design a network, you have to trust someone, especially the network administrator.

If a user has been given improper clearances, however, there's no way the remote administrator can see that and protect his resources. A renegade user who gains administrator privileges in a master domain where he could do little harm would have access to other master domains where he could inflict damage.

With NT Server, supplying security across master domains is not automatic. It requires close synchronization of administrative efforts. The more master domains, the more administrative responsibility and the more room for error.

If you want strong, centralized administration and close-knit groups, then NT will make you "sweat bullets" as you try to design an accessible but secure network, in the words of one security manager in San Francisco.

NT lags behind Novell's NetWare in this respect. NetWare 4.1's global directory lets an administrator implement security in a straightforward manner. In addition, it's scalable across many NetWare networks.

That advantage doesn't seem to be enough to save NetWare in the current climate. Some information systems managers see synergies emerging among NT as a client, NT as a server, the BackOffice suite of servers and Microsoft applications. One of these is the National Association of Security Dealers (NASD), the operator of the Nasdaq Stock Exchange, which is converting from NetWare to NT Server.

As NASD designed its network, however, it faced a problem. Its operations are dispersed, with data centers in Trumbull, Conn., and Rockville, Md., administrative offices in New York and Washington and 15 examiner offices. Theoretically, several master domains would be appropriate. But security was a paramount concern to NASD.

Duke Tunstall, director of emerging technology and integration, confronted this issue when he mapped out NASD's NT Server networks.

Despite the fact that NASD is geographically distributed, he combined all users into one master domain. That gave a single administrative staff control over all user accounts.

Total control

But Tunstall acknowledges that not every organization can do what he did. NASD has only 2,700 users, who can be neatly combined into one master domain. Larger organizations would face both performance and management problems.

"Administration of 10,000 to 15,000 users by a single administrative group would be a nightmare," Tunstall says.

Such a large group could be broken into multiple master domains, but the resulting blind spots would give some network administrators security nightmares.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

No postage due

Microsoft is beta-testing Internet Mail and News, a cousin to its recently released Exchange electronic-mail system. The free Simple Mail Transfer Protocol/POP 3 mail client — for Windows 95 and Windows NT — will let users work online and sort, store and view E-mail messages. The newsreader can connect users to multiple mail servers, automatically decodes binary files and supports the same preview pane and filters offered by the mail client.

A switch in time . . .

3Com Corp. this week will announce plans to shore up its flagship LANplex chassis hub with Ethernet, Fast Ethernet and Fiber Distributed Data Interface switching modules as well as a module that can link the switches to Asynchronous Transfer Mode (ATM) networks. The switching modules will be rolled out between now and early next year.

Windows 95 at your service

Microsoft this fall will ship in volume its second free-service pack that features enhancements for Windows 95, said Alec Saunders, Microsoft's product manager for desktops and systems. The Windows 95 OEM Service Release 2 pack will support a wider variety of network hardware, 32-bit File Allocation Table, 3.3-volt PCMCIA cards and Microsoft's Active Movie.

Closing the gap

Router market leader Cisco Systems this week will announce a family of routers that was designed to give users an intermediate step between Cisco's 7000 and 7500 router lines. The new 7204 and 7206 routers will support up to 48 Ethernet, 24 Token Ring or 24 serial ports. The routers will ship in the third quarter and will cost $1,285 per port. The routers will support Cisco's recently announced NetFlow Switching scheme, which gives users an alternative to ATM switching.

The 5th Wave by Rich Tennant

"We met on the Internet, and I absolutely fell in looove with his syntax."

Information Builders re-Focuses 4GL

Enterprise middleware vendor Information Builders is about to roll out a high-end client/server development system to replace Focus, the company's aging fourth-generation language (4GL). The new system, code-named Cactus, has all the usual bells and whistles, including support for managing applications and deploying them on the Web.

Count us in

You can add Hewlett-Packard to the list of vendors that are feverishly developing low-cost network computers that will let users run applications on the Internet or corporate intranets. HP is in the process of developing a desktop terminal and a portable palmtop device. But insiders said neither product will see the light of day until prices of $500 to $800 include a monitor. That probably won't happen until sometime next year. "It's not even interesting unless we get the price under $1,000," an HP official said.

Our Internet E-mail brought us this insightful list — Top 10 reasons why computers must be male: 10. They have a lot of data, but they are still clueless. 9. A better model is always just around the corner. 8. They look nice until you bring them home. 7. It's always necessary to have a backup. 6. They'll do whatever you say if you push the right buttons. 5. The best part of having either one is the games you can play. 4. In order to get their attention, you have to turn them on. 3. The lights are on, but nobody's home. 2. Big power surges knock them out for the night. 1. Size does matter. We'd love to hear your Top 10 gripes, loves, jokes or tips. Please send the information along to News Editor Patricia Keefe at patricia_keefe@cw.com, or call her at (508) 820-8177.

"OS/2 Warp Server has what it takes to kick Novell networks into overdrive, and

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